DECEMBER 21, 1940

19196

THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2.

Telegrams: LANCET, RAND, LONDON. Telephone: TEMPLE BAR 7228 and 7229.

No. XXV. OF VOL. II., 1940. LONDON, SATURDAY, DECEMBER 21, 1940. Pp. 72—Price 1s.
No. 6121. VOL. CCXXXIX. Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription Inland £2 2s. Abroad £2 10s.

LIBRARY OF CONGRESS · PERIODICAL DIVISION · MAR - 6 1941

OXFORD MEDICAL PUBLICATIONS

SEE PAGE 3

H. K. LEWIS & CO. LTD.
MEDICAL PUBLISHERS AND BOOKSELLERS
MEDICAL AND SCIENTIFIC LENDING LIBRARY
CHRISTMAS HOLIDAYS, 1940.
All Departments will be closed December 25th and 26th.
London: 136 & 140 Gower Street, W.C.1.

PROBLEMS OF
ANÆSTHESIA IN GENERAL PRACTICE
By D. H. LUKIS, M.D., B.S.Lond.,
Late Hon. Anæsthetist, South London Hospital; late Clinical Assistant, Ear, Nose, and Throat Department, Queen's Hospital for Children; Hon. Medical Officer, Kingston Victoria Hospital.
Demy 8vo. 7s. 6d. net (postage extra). 158 + vi pages.
Hodder & Stoughton Ltd., 20, Warwick-square, E.C.4.
"This book is of outstanding merit. . . ."
—EDINBURGH MEDICAL JOURNAL.

RECTAL SURGERY
By
W. ERNEST MILES, F.R.C.S.Eng., F.R.C.S.I., F.A.C.S.
Senior Surgeon to the Gordon Hospital for Diseases of the Rectum and Colon, &c.
369 pages, 2 plates in colour and 105 text illustrations. 17/6 net.
"This book is without doubt the best that has so far been published on this important subject."
—MEDICAL PRESS AND CIRCULAR.
Cassell & Company Limited, La Belle Sauvage, E.C.

PUBLISHED 10TH OCTOBER, 1940
LANCET WAR PRIMER
WOUND INFECTION
Edited by W. H. OGILVIE
96 pp. 2s. 6d. net Plus 3d. postage
THE LANCET Ltd., 7, Adam-street, Adelphi, W.C.2

With 132 Illustrations. Demy 8vo. 15s. net; postage 6d.
CHEST DISEASE IN GENERAL PRACTICE
By PHILIP ELLMAN, M.D., M.R.C.P.
Foreword by Prof. S. LYLE CUMMINS, C.B., C.M.G., M.D.
London: H. K. Lewis & Co. Ltd., 136 Gower-Street, W.C.1.

RADIOTHERAPY IN THE DISEASES OF WOMEN.
By MALCOLM DONALDSON, B.A. (Cantab.), F.R.C.S. (Eng.), M.B., Ch.B. (Cantab.)
Physician Accoucheur with Charge of Out-patients, St. Bartholomew's Hospital; Consulting Gynæcologist, Royal Northern Hospital, &c.
Demy 8vo. 148 pages. 11 Illustrations in the Text; 2 Plates, one in Colour. Price 7s. 6d. net; postage 7d.
Hodder & Stoughton Ltd., 20, Warwick-square, E.C.4.

Free to the Medical Profession on request. Cloth bound Ed. 5s.
ARTIFICIAL LIMBS.
"SOLVITUR AMBULANDO."
A Symposium on Prosthetic Achievement.
Pp. 72. 37 Coloured Plates.
"I congratulate you on this interesting, instructive, and artistic production. I consider it to be a very great addition to my library."—M.B., Ch.B., F.R.C.S.
J. E. Hanger & Co., Ltd., 7, Rochampton House, Roehampton, S.W.15.

ANATOMY IN THE LIVING MODEL.
By DAVID WATERSTON, M.A., M.D., F.R.C.S.E., F.R.S.E.,
Bute Professor of Anatomy at the University of St. Andrews.
276 pages. 74 Illustrations. 16 Coloured Plates. Price 15s. net; postage 9d.
". . . can be read and re-read by the student, general practitioner, the surgeon and physician."
—ST. BARTHOLOMEW'S HOSP. JOUR.
Hodder & Stoughton Ltd., 20, Warwick-square, E.C.4.

DISEASES OF THE THYROID GLAND.
WITH SPECIAL REFERENCE TO THYROTOXICOSIS.
By CECIL A. JOLL, M.S., B.Sc., F.R.C.S. (Eng.).
Crown 4to. Fully Illustrated. £3 3s. net.
"Mr. Joll has presented his fellow practitioners and students with a monumental volume. They need not trouble to search the literature published up to the time this volume went to press, for they will find everything relevant within its covers."
—BRITISH JOURNAL OF SURGERY.
William Heinemann (Medical Books) Ltd., 99, Great Russell-street, London, W.C.1.

AN AYLESBURY BROADSIDE
Now Ready. From all Booksellers. Price 3d.
Setting out, from the medical standpoint, the grounds, social, economic and physiological, for the immediate grant of family allowances on a national scale.
The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2.

Recently Published. 4th Ed., fully revised, 954 pp., 930 Illus.
EMERGENCY SURGERY. 63s. net; postage 9d.
By HAMILTON BAILEY, F.R.C.S.(Eng.)
Bristol: John Wright & Sons Ltd. London: Simpkin Marshall Ltd.

In Two Volumes. SELECTED WRITINGS OF
JOHN HUGHLINGS JACKSON.
M.D., F.R.C.P., F.R.S.
I.—EPILEPSY AND EPILEPTIFORM CONVULSIONS.
II.—EVOLUTION AND DISSOLUTION OF THE NERVOUS SYSTEM: SPEECH: VARIOUS PAPERS: ADDRESSES AND LECTURES.
Edited by JAMES TAYLOR, M.D., F.R.C.P.
With the advice and assistance of GORDON HOLMES, M.D., F.R.C.P., and F. M. R. WALSHE, M.D., F.R.C.P.
Over 500 pages in each vol. Price 25s. net each; postage extra (inland 9d., abroad 10d.).
Hodder & Stoughton Ltd., 20, Warwick-square, E.C.4.

Second Edition. Pp. 190 + viii. 6s. net. Recently Published.
PRINCIPLES OF MEDICAL STATISTICS
By A. BRADFORD HILL, D.Sc., Ph.D.
The Lancet Limited, 7 Adam-street, Adelphi, London W.C.2.

12/6 net INTRODUCTION TO 12/6 net
DISEASES OF THE CHEST
By
JAMES MAXWELL, M.D. (Lond.), F.R.C.P. (Lond.)
Assistant Physician and Demonstrator of Practical Medicine, St. Bartholomew's Hospital; Physician, Royal Chest Hospital; Consulting Physician, Royal National Sanatorium, Bournemouth
Demy 8vo 328 + xii Pages 37 Chapters with 95 Illustrations
HODDER & STOUGHTON LTD. 20, WARWICK SQUARE, E.C.4

For the relief of **ASTHMA**

BRONCHOSPASM must be abolished

Morphia and other narcotics are definitely contra-indicated in all chronic disease . . .

Felsol . . .

relieves bronchospasm immediately yet FELSOL POWDERS contain *no* morphia or other narcotic

For full particulars of the FELSOL TREATMENT of ASTHMA *without narcotics* and a supply of powders for clinical trial write :—

BRITISH FELSOL COMPANY LTD.

Telephone : Clerkenwell 5862

Wigton House, 206/212, St. John Street, Clerkenwell - - - - - London, E.C.1

Telegrams : Felsol, Smith, London

EPHEDRINE THERAPY

EPHEDROL BRAND

A Standard Remedy for

COLDS, CATARRH and HAY FEVER

EPHEDROL is a standard remedy for Catarrh, the Common Cold and Hay Fever. Its method of application from the patent 'nasal' bottle is endorsed by medical authority as being cleaner and more efficacious than spray, dropper or douche.

Samples and Medical literature supplied on request.

EPHEDAN BRAND

The Ephedrine Powder Treatment of

ASTHMA and BRONCHITIS

EPHEDAN is quicker and more effective than tablets with the same Ephedrine content. Ephedan powders give immediate relief to the congested feeling in the bronchial tubes. In many cases they have effected a permanent cure.

CLAY & ABRAHAM LTD. CANDA *Manufacturing Chemists*, LIVERPOOL

CER 166

"An After-Fitting Service to meet changing Aural Conditions"

OUR SERVICE TO DOCTORS AND THEIR DEAF PATIENTS!

IN prescribing "Ardente" for your deaf patients when an aid becomes necessary, you are safe because they can obtain service in most important towns throughout Great Britain—to meet any change in their aural condition. As an additional safety factor, each "Ardente" is covered by its maker's guarantee. There is a full range of "Ardente" types—electrical and non-electrical Bone-Conduction, Granule, Valve and Phantom types—which are individually suited, after Auramotor Test, to the needs of each case—no expense being incurred until hearing satisfactorily.

R.A. Dent
M. Inst. P.I.

Particulars gladly sent and Tests are made at Aurists, Doctors' patients, Hospital, or any of our addresses. Medical Press Reports are interesting. 10 Medals, 5 Diplomas. Supplied under National Health Insurance.

ARDENTE LTD.— 309 OXFORD STREET, LONDON, W.1 (Between Oxford Circus and Bond St.) 'Phones : Mayfair 1380/1718/0947

Birmingham Bristol Cardiff Exeter Edinburgh Glasgow Leeds Leicester Liverpool Manchester Newcastle Southampton

DECEMBER 21, 1940

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, CHEMISTRY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 6121 LONDON: SATURDAY, DECEMBER 21, 1940 CCXXXIX

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

Mass Psychotherapy. By E. N. SNOWDEN, M.B. ... 769

Control of Air-borne Infection in Air-raid Shelters and Elsewhere: Bacteriological Technique—Organisms in Coarse Droplets—Organisms in Droplet Nuclei—Bactericidal Mists—How and When to Spray—Organisms on Dust. By C. H. ANDREWES, F.R.C.P., F.R.S. ... 770

Effects of Serum and Saline Infusions: Quantitative Studies in Man. By D. K. HILL, B.A., J. MCMICHAEL, F.R.C.P.E., and E. P. SHARPEY-SCHAFER, M.R.C.P. With technical assistance of A. C. PINCOCK (*with charts*) 774

Operation for Penoscrotal Hypospadias. By DAVID LEVI, F.R.C.S. (*illus.*) ... 777

An Outbreak of Paratyphoid B in Bristol. By I. G. DAVIES, M.R.C.P., K. E. COOPER, M.R.C.S., J. WISEMAN, B.Sc., and J. M. DAVIES, B.Sc. (*with chart*) ... 778

Agranulocytosis after Sulphapyridine Therapy: with Recovery. By J. E. G. PEARSON, M.R.C.P., and A. A. G. LEWIS, M.B. ... 779

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE: Section of Surgery—Chest Injuries ... 780

LEADING ARTICLES

ANÆSTHESIA IN THE SHOCKED PATIENT ... 783

WANTED: A LEAD ... 783

TRAUMA AND CANCER ... 784

QUICK CURES FOR A COLD 784

ANNOTATIONS

The A.M.A. at Bay ... 785

Evacuation Problems Getting Solved ... 786

Pantothenic Acid and Adrenal Lesions ... 786

Monkey Tricks in the Nursery ... 786

Cardiovascular Syphilis ... 787

Endocrines and Involutional Melancholia ... 787

SPECIAL ARTICLES

Immunisation against Bacterial Toxins: Tetanus—Gas Gangrene—Diphtheria. Being an abstract of the second Harben lecture delivered by Lieut.-Colonel H. J. BENSTED, R.A.M.C. ... 788

St. Loyes' Training Centre 789

REVIEWS OF BOOKS

Textbook of Dietetics. By Prof. L. S. P. Davidson, F.R.C.P., and I. A. Anderson, M.B. ... 782

Statistical Calculation for Beginners. By E. G. Chambers, M.A. ... 782

A General Zoology of the Invertebrates. By G. S. Carter ... 782

The Microscope. By R. M. Allen ... 782

LETTERS TO THE EDITOR

Carbon-monoxide Poisoning (Dr. Gilbert Burnet) ... 795

Pneumococcal Meningitis (Dr. Kenneth Robertson) 795

Compulsory Immunisation (Dr. A. A. Cunningham) 795

Blood-urea and Plasma Chloride in Experimental Hæmorrhage (Dr. I. Harris) ... 795

The Cassel Hospital (Sir Farquhar Buzzard, F.R.C.P.) ... 796

Things to Come (Dr. Hugh Gainsborough, Mr. E. T. C. Milligan, F.R.C.S.) ... 796

Too Much Ventilation (Sir Leonard Hill, M.B., F.R.S.) ... 796

Nicotinic Acid for Blisters on the Lip (Prof. Gordon Campbell, L.R.C.P.E., L.D.S.) ... 796

PARLIAMENT

Question Time: Vitamin Potency of White Flour—Supply of Milk—Heating of Air-raid Shelters—N.H.I. Benefits—Medical Welfare Work in Africa—R.A.M.C. and Physiotherapy—Dental Surgeons as Anæsthetists—Medical Practitioners and Air-raid Damage—Transfer of Panel Patients—Soldier's Death in Isolation Hospital—Ministry of Health Circulars—Evacuation of Tuberculous Persons ... 793

Births, Marriages and Deaths ... 797

Appointments ... 798

PUBLIC HEALTH

From the Annual Reports: Northampton—Salford—Brighton—Bootle ... 790

Infectious Disease in England and Wales ... 791

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents ... 791

OBITUARY

Caleb Williams Saleeby, M.D. (*with portrait*) ... 794

Frederick Wallace Edwards, F.R.S. ... 794

NOTICES

The Evill Doctor ... 798

Triple Dye Lotion for Burns 798

Lancet Crossword ... 798

Lament for Chocolate ... 794

MEDICAL NEWS

University of Oxford ... 797

Royal College of Surgeons of England ... 797

University of London ... 797

University of Edinburgh ... 797

University of Dublin ... 797

National University of Ireland ... 797

Army Casualties ... 797

Medical War Relief Fund ... 797

St. Thomas's Hospital Medical School ... 780

THE MEDICAL DEFENCE UNION

ESTABLISHED 1885 EDGware 1373

MEMBERSHIP EXCEEDS 22,500

Annual Subscription £1 Assets exceed £100,000 Entrance Fee 10s.

No entrance fee to those joining within twelve months of registration

Full particulars from

The Secretary, The Medical Defence Union, Ltd., Bonnington, Stonegrove, Edgware

NEW ADDRESS *of*

C. L. BENCARD (1934) LTD.

GORGATE HALL EAST DEREHAM

NORFOLK

Telephone : GRESSENHALL 248 Telegrams : INSULIN, DEREHAM

Late of

ENDERSLEIGH GARDENS, HENDON, LONDON, N.W.4

Particulars of our skin testing and desensitising solutions for the treatment of Asthma and Hay Fever, as well as of our other preparations in the treatment of Asthma and Anaemia, will gladly be forwarded.

Please note that injections against next year's hay fever should be commenced early in the New Year to obtain the very best results. Please do not commence treatment much later than the middle of February or beginning of March.

THE MAN WHO KNOWS

More than ever today people are inclined to look to their doctor for authoritative advice in matters of birth control. When called upon to recommend a contraceptive the doctor's position is a delicate one and he must have confidence in knowing that he can place complete reliance in the manufacturers whose brand he names.

Even more important than the long-established reputation of Burge, Warren & Ridgley in this particular field is their unremitting care in safeguarding and enhancing that reputation. Their name is an absolute guarantee of security in a contraceptive.

BURGE, WARREN & RIDGLEY, LTD.
91-92, Saffron Hill, London, E.C.1
Telephone : HOLborn 0050.
Telegrams : "Drugsund, Smith, London."
ESTABLISHED 1850.

Philips all metal cradle with two switch variable heat control, combining minimum weight with maximum strength. The ideal bath for ward use. Conforms to Ministry of Health recommendations. 6-lamp, 9-lamp and 12-lamp sizes.

IMMEDIATE DELIVERY ALL TYPES

PHILIPS METALIX

(Philips Lamps Ltd.)
Century House, Shaftesbury Avenue, London, W.C.2.

ORIGINAL ARTICLES

MASS PSYCHOTHERAPY

By E. N. Snowden, M.B. Lond.
PSYCHOLOGIST TO HOSPITAL FOR NERVOUS DISEASES, MAIDA VALE

THE problem of giving an adequate treatment to every patient attending the psychological outpatient department of a hospital has exercised psychotherapists ever since the public came to realise that help could be obtained for nervous troubles. The patients soon demonstrated to the medical profession that this help was welcome by crowding the departments.

If psychotherapy was to justify itself these patients had to receive more in the special departments than they were accustomed to obtaining from their medical practitioners—more than a few words of reassurance and a sedative mixture. The large numbers who attended found the specialists unprepared. A tradition had grown up that anxiety states and similar illnesses were the result of a disturbance in the intimate life of the individual, and that this could only be met by a series of long and secret interviews. Most of the methods of psychological practice, including psycho-analysis, were founded on this principle, and proved to be too slow and elaborate for dealing with large numbers. It is generally agreed that a partly completed analysis is actually harmful to the patient, so that analytic methods can only be used for selected cases and do not solve the problem presented by a crowded outpatient department.

The practical alternative is the method of explanation and re-education. There is nothing new about it; every medical practitioner uses it many times a day in the ordinary task of reassuring an anxious patient. Its simplicity has, fortunately, saved it from being elaborated into a cult, but there is nothing to prevent it being developed into a rapid and effective psychotherapeutic technique. It depends on the facts that in nearly all cases of anxiety or loss of function the cause of the condition is well known to the patient or can be discovered by a little careful questioning, and that he has not associated the symptoms with the cause. He must be helped to see that the symptoms of anxiety are physiological and physical more often than psychological and mental, and are a normal response to the circumstances in which they arise. In most cases there are secondary anxieties, due to his lack of understanding of the nature of the anxiety symptoms themselves, and these secondary anxieties are removed by the explanations. Once the patient realises that the symptoms need not cause anxiety, and that the originating cause is in the past, the way is prepared for re-education; this is directed towards correcting wrong habits of thinking which have become a part of the patient's life, and which may have persisted for many years. In this re-education the patient takes an active part, using the knowledge which the explanation has given him to help his own reasoning.

The method of psychotherapy thus briefly outlined is the most effective for outpatients, and is the most rapid that can be devised; but, as generally used, it still requires separate interviews with the patients and a constant repetition of the same explanations. The numbers that can be treated are still too few in comparison with the number of patients who attend for treatment. Of forty patients attending a department at one session only very few can be given an individual explanation and fifteen minutes of quiet and careful teaching; the remaining cases must be slurred over. If the numbers are restricted by personal appointments the great demand for treatment soon produces a long waiting-list. The difficulty cannot easily be met by increasing the number of psychotherapists unless the amount of accommodation available can be considerably increased, and at most hospitals this is impossible.

GROUP TREATMENT

Most of the cases attending a psychological department suffer from anxiety neurosis of some kind with secondary anxieties; the cause of the anxiety varies greatly, but the psychological mechanism by which the symptoms are produced is essentially the same in every case. At any one session the same explanation is inevitably given to a number of patients one after another, and it seemed that it might be possible to collect the patients of any one type together and give the explanation to them as a class. It was necessary to find out whether the patients would like it, and whether it would be equally effective as a form of treatment without the close personal association of the private interview. The outbreak of war, and the need to continue the service of the hospital with a depleted staff, made an experiment on these lines necessary if the psychological department was to continue to function, and the scheme was therefore tried out at the Hospital for Nervous Diseases, Maida Vale.

The idea has proved to be successful beyond all expectations. The patients enjoy the "lectures," and an atmosphere of cheerfulness and expectation of cure is evident in the department. The improvement in individual cases has been more rapid.

The method is simple. The first interview with the patient is diagnostic, and must achieve three objects, namely:

1. To decide whether the patient is suited for this method of treatment. (Elderly or deaf people cannot be expected to benefit, and many cases of psychosis are unsuitable, although one case of suicidal depression has been cured.)
2. To discover the cause of the illness, and at what period of the patient's life it originated.
3. To explain to the patient the purpose of the new method of treatment.

A careful history is taken. The psychotherapist can be relieved of much of this work by an assistant. By arranging a special case-form for this history the work is much simplified and anyone accustomed to interviewing can soon learn how to use the form. It is devised to explore the five successive phases of the patient's life: childhood, school life, adolescence, working life, and married life or its equivalent. In addition there is a section in which symptoms can be recorded and another for a description of the beginning of the illness with special reference to the mental and physical health just previous to the onset. Working on this case-note as a basis, the psychotherapist can usually discover the origin of the illness, by putting a few questions to the patient at the first interview.

When large numbers are to be treated the patients can now be divided into types, and a special series of talks devised for each class. In practice it has not been possible to do this, and patients of every type have been treated together, the talks being arranged to cover the whole field of psychological illness with special reference to the anxiety states. This method of treating the different types of cases together has worked very well. The talks to the class are simple and are made as interesting as possible, so that the patients appreciate and enjoy hearing about the new aspects of life that they disclose. They come to realise that psychological illness is a natural process, a consequence of the originating cause, and that if the symptoms can take various forms the basic causes are, in most cases, similar to their own. This appears to give them confidence in the method, because they can listen to explanations of symptoms different from their own without emotion, and so with a better understanding. The course consists of eight lectures, and each patient attends once a week, so that the whole treatment takes eight weeks to complete.

The subject of the talks can be varied in any way that the therapist considers necessary, and if the patients are separated into groups the course can be elaborated to deal with various aspects of the group symptoms; but in the present experiment, where the patients are all treated together, the first three lectures deal with various aspects of the anxiety states, then follow separate talks on depression, experience and phobia, simple mental conflict, physical and mental introspection, and a final talk on the application of the principles put forward. Diagrams, illustrating the talks, are built up on a blackboard to assist the explanation and to help the patients to concentrate. Each lecture takes about 20 minutes to deliver.

After the talk, the patients are allowed to sit together and discuss the subject treated, while they are interviewed separately. These separate interviews last from three to five minutes—long enough for the physician to glance at the case-sheet, to call attention to any point in the lecture which specially applies to the patient's case, to make any additional note, and to prescribe any appropriate medicine. It is wise to make the length of these short interviews as far as possible the same in every case, so as to avoid discontent among the patients. The numbers in the different classes have varied from time to time during the twelve months of the experiment, and the largest class hitherto treated has been 22, but a class of 40 patients could quite well be dealt with in a three-hour session. By multiplying the number of sessions, a very large number of patients could receive a full course of treatment every two months. The method can readily be taught to any medical man who has had a good general training and who has an aptitude for the work, even if he has not had, previously, an extensive experience of psychological cases. The war has already provoked psychoneurosis in some people who would otherwise have remained healthy. The numbers threaten to be great, and adequate treatment of them will require a larger number of trained psychotherapists than is at present available, and more accommodation for treatment than is likely to be forthcoming. Mass psychotherapy may offer a solution of the problem.

SUMMARY

The psychotherapeutic method of explanation and re-education is the method of choice for outpatients. It can be used for the treatment of large numbers by giving explanatory lectures to a class, and supplementing them in short personal interviews.

Mass psychotherapy of this kind has been tried over a period of twelve months with satisfactory results.

It enables the psychotherapist to treat much larger numbers than by any other means without fatigue, and can be adapted for any type of case.

CONTROL OF AIR-BORNE INFECTION IN AIR-RAID SHELTERS AND ELSEWHERE

By C. H. Andrewes, M.D. Lond., F.R.C.P., F.R.S.

AND A TEAM OF WORKERS AT THE NATIONAL INSTITUTE FOR MEDICAL RESEARCH, LONDON

In the early months of the war the late Sir Patrick Laidlaw initiated, at the National Institute for Medical Research, a programme of work on air-borne infections, and the subject has ever since been under study here by a team of workers. Those responsible for various branches of the work have been Dr. R. B. Bourdillon, Mr. R. K. Callow, D.Phil., Dr. D. G. ff. Edward, Mr. W. J. Elford, Ph.D., Mr. R. E. Glover, F.R.C.V.S., Sir Patrick Laidlaw, F.R.S., Mr. O. M. Lidwell, Ph.D., Miss Dora Lush, M.Sc., Dr. R. J. V. Pulvertaft, Dr. C. Todd, F.R.S., Dr. M. van den Ende and myself; this article is published on behalf of the whole team. Details of results obtained will be published by those concerned as they are completed. Meanwhile there is need for all possible precautions against winter diseases, the normal threat of which is increased by the widespread use of overcrowded and often ill-ventilated air-raid shelters. The need for advice on such precautions to those concerned with practical measures does not permit of delay until experiments have been finished to our own satisfaction, and we are therefore publishing this progress report of some of the work carried out at Hampstead, and of the provisional conclusions reached.

Infection through the air may be conveyed in one of three ways.

(1) Relatively large droplet projectiles from 0·1 to 1 mm. or over in diameter may be sprayed from the mouth and nose to a distance of perhaps 15 ft., but these will reach the ground fairly quickly.

(2) Similarly expelled droplets 0·1 mm. in diameter or less (Wells and Wells 1936) will have become so small through evaporation before they reach the floor that as droplet nuclei, consisting of one or very few bacteria, they can float in the air for many hours, or even days. The viability of organisms in droplet nuclei varies; pneumococci and streptococci are particularly resistant. Wells believes that droplet nuclei are of major importance in carrying air-borne infection.

(3) Organisms reaching the floor, bedclothes and other objects may survive on dust which may be subsequently swept up and re-suspended in the air to become a source of danger later. Tubercle bacilli, hæmolytic streptococci and diphtheria bacilli * are among those which may survive in dust. We do not know enough of the relative importance of these three modes of infection. The wise course is therefore to devise means of coping with all three. However in attempting to evaluate the effectiveness of our methods of attack, many technical difficulties are encountered.

Bacteriological Technique

Enumeration of bacteria in air.—It is of primary importance that we should be able to count and identify the bacteria suspended in air, but the variety of methods in use for this purpose shows that none of them is perfect. Exposing agar plates under standard conditions is the easiest method, but these only catch a small and not necessarily representative proportion of suspended organisms. The air-centrifuge designed by Wells aims at depositing the bacteria from large measured volumes of air on the agar which lines rotating cylinders; the colonies growing thereon can be counted. A simpler apparatus devised by Hollaender and Dalla Valle (1939) draws measured volumes of air through a funnel and lets it play on agar plates; many more organisms can thus be caught than by ordinary plate-exposure methods. None of these methods will trap every air-borne bacterium but this may not matter much if the main interest is in the relative numbers of organisms present under different conditions. Analysis shows, however, that the bacteria caught by all these methods are largely sporing aerobic bacilli and cocci from skin, dust and clothes. Such organisms are of far less interest as potential pathogens than the denizens of the respiratory tract. The abundant dust-borne bacilli and cocci are in practice hard to kill by some of the available methods of control, so that air-samples obtained before and after treatment with ultraviolet light or disinfectant mists, for example, may show no appreciable fall in the bacterial population. The value of such methods in eliminating pathogenic organisms might therefore be unjustifiably discredited. Where a readily identifiable pathogen such as *Streptococcus hæmolyticus* is concerned (cf. Cruickshank and Muir 1940) encouraging results have not been so difficult to obtain. Gordon (1902–03) Wells and others (1939) and Buchbinder and others (1938) have urged that *Strep. viridans* should be sought for and used as an index of respiratory air-pollution just as *Bacillus coli* is used in water-hygiene, but our studies have not yet produced a quick and practicable method of estimating its presence quantitatively. The use of blood-agar containing 1 : 500,000 gentian violet may prove of value in suppressing many unwanted "tin cans and kettles," such as air cocci, while permitting streptococci to grow (Garrod 1933).

Methods of testing counter-measures.—During the work at Hampstead we have proceeded from tests in small glass desiccators and aspirator jars to tests in specially designed metal tanks, in small rooms and finally in the field. Bacteria and viruses in various media have been suspended in the air in fine sprays; tests have been made of their normal persistence and their resistance to ultraviolet light, antiseptic mists and other measures. As will be shown later, bacteria thus suspended as droplet nuclei are relatively vulnerable to counter-measures and particularly so when sprayed in aqueous suspension free from other organic matter, whereas organisms on dust are far harder to kill. A fortunate chance has permitted us to make tests on organisms reaching the air naturally from the respiratory tract. A ferret infected with influenza virus accidentally became infected with a hæmolytic streptococcus (group C Lancefield). This streptococcus would not infect normal ferrets when

* Personal communication about the diphtheria bacilli from Prof. H. D. Wright.

inoculated intranasally but readily established itself in the noses of ferrets infected with influenza. On blood-agar plates exposed in a cubicle containing such a doubly infected ferret numerous colonies of hæmolytic streptococci appeared with regularity and a remarkable opportunity was thus available for studying the effects of control measures on organisms actually scattered from the respiratory tract of an infected animal. No certainty exists as to whether the streptococci reached the plates directly as a result of sneezes or after drying and redistribution into the air.

Methods of Control

No method for the control of infection is as effective as adequate spacing of individuals combined with adequate ventilation. These enormously reduce the risk of infection whether from droplets, droplet nuclei or dust. The methods now to be described are of value only as second-rate substitutes where proper spacing and ventilation cannot be achieved.

ORGANISMS IN COARSE DROPLETS

One can hardly expect to be able to control bacteria contained in coarse droplets spat, coughed or sneezed directly from one person to another except by mechanical means. The most efficient of these is doubtless the isolation of the infected person or the dissuasion of potentially infectious persons from working or sheltering in close contact with others. Where the nature of the sleeping quarters permits, a sheet of plaster-board or other material placed between the heads of adjacent sleepers would be expected to stop the passage of coarse droplets.

Masks.—Where mixing of normal and infected persons is inevitable masks may prove of great value. The double layer of coarse gauze used by some surgeons has been shown to be relatively inefficient in stopping droplets. Four layers of finer gauze (mesh at least 48 to the inch) will stop coarse droplets when worn for several hours by a normal person; whether this would be effective against the droplets emitted during a succession of sneezes is more doubtful. A layer of Cellophane between two layers of gauze is a much better barrier, but, even more than other masks of this type, may prove unacceptable to those introduced to it for the first time. It may be easier to induce people, particularly women, to wear something like a "yashmak" with some impermeable material incorporated in it immediately in front of the nose and mouth.

A simple, easily tolerated, transparent mask may be made of cellulose-acetate sheet (9 in. × 5 in. × 5/1000 in.; a smaller pattern measures 5½ in. × 5 in. × 5/1000 in.). The top edge is bound with adhesive tape and held across the nose either by elastic or by glazite-coated copper or brass wire loops. Loops over the ears hold the mask on the face and by extending or compressing a V-shaped section of wire in front of each ear a single size of mask can be adapted to widely differing faces. A mask like this could probably be mass-produced at a cost between 1*d.* and 2*d.* Such a mask will effectively stop directly projected droplets, except when projected downwards, as has been shown by experiments in which people with and without masks rinse out their mouths with cultures of *B. prodigiosus* and then talk in front of exposed agar plates.

Transparent cellulose-acetate masks, being carried well away from the face, are free from the criticism that they may cause congestion of the mucous membranes and hinder a healthy to-and-fro passage of air. They can be comfortably worn by people with colds, while gauze masks cannot; moisture may, however, be found to condense on them in the very humid atmosphere of some air-raid shelters.

The various types of masks are effective, to different degrees, in stopping the dispersal of organisms by an infected person. How far will their use protect a normal person from infection? Probably fairly well so far as coarse droplets are the source of danger, the truly impermeable masks (cellophane in gauze and cellulose acetate) being the more efficient. It is desirable in designing masks of any type to ensure that the wearer cannot wear them one way round on one occasion and inside-out on the next, without intervening sterilisation. Preliminary tests suggest that none of the masks discussed here can be relied on to prevent the inhalation of organisms in the form of droplet nuclei. Persons breathing a dilute artificial mist of *B. prodigiosus* for 10 minutes were not prevented by any type of mask from yielding a growth of the organisms when nasal swabs were taken at the end of the period.

It is probably unnecessary and certainly futile to try to persuade all occupants of air-raid shelters and others in crowded places to wear masks now. But it should not be impossible to induce workers and "shelterers" to wear them for three or four days at the onset of a severe cold; or to get them generally used in all public places in the presence of a severe influenza epidemic. Masks could not, of course, be worn during eating. Gauze, but not cellulose-acetate, masks can be worn during sleep. Many fewer organisms are distributed into the air during sleep than in waking hours; there would probably be little object, therefore, in encouraging sleeping in masks unless for people with coughs.

Serious attempts at persuasion or compulsion would have to be preceded by a propaganda campaign in which the means of transference of respiratory infections would be simply explained. It would be possible to provide instantaneous photographs of sneezes with the droplets displayed by strong illumination (such as have lately been published in America) to illustrate the protective effects of masks.

ORGANISMS IN DROPLET NUCLEI

Ultraviolet light.—There have been enthusiastic reports of the value of ultraviolet light, particularly from America. Our own experiments on a laboratory scale confirmed its remarkable bactericidal action. A germicidal ultraviolet lamp, consisting of two 12 in. quartz tubes suspended in a bowl, was placed in a room of 800 cu. ft. capacity, so that light shone upwards and irradiated the space between it and the ceiling but was screened by the bowl from the direct vision of people in the room—a necessary precaution against eye-injury. A mist of *Strépt. salivarius* or staphylococci suspended in broth was sprayed into the room and was made to circulate round the room by an electric fan as well as by convection currents from a hot-water radiator. As the bacteria passed in course of time in front of the lamp they were exposed to its bactericidal rays. Plates exposed in the room without the lamp showed that the organisms recoverable during five minute exposures fell from about 23,000 to 17,000 in twenty minutes. When the lamp was switched on the corresponding drop was from 23,000 to 115. This rate of fall would be achieved by a ventilation turn-over of thirty changes per hour. Even more striking results were obtained when bacteria were sprayed into the room continuously. Instead of a banking-up effect, a fall from 18,000 to 730 organisms per plate occurred in ten minutes. Extensive experiments under rather different conditions with other types of lamp also gave encouraging results.

Trials under practical conditions, in hospital wards and elsewhere, did not confirm our optimistic impressions. In the best set of circumstances the number of organisms was reduced to half or a quarter by the lamps but in many tests no fall at all was recorded. Many factors militated against the success of the trials, one in particular being of major importance; the bacteria recovered on plates and in the Wells centrifuge were mainly dust organisms—cocci and sporing bacilli. A return to laboratory tests showed us that these bacteria on dust are extremely resistant to the action of ultraviolet light. Thus, though we could obtain but poor evidence of a beneficial effect from ultraviolet light, it is possible that pathogens from the respiratory tract were being killed but that the fact eluded our observation, owing to the vast numbers of other organisms obscuring them. In a few experiments with the streptococcus-emitting ferret already mentioned, an ultraviolet lamp produced a drop in the numbers of streptococci falling on to exposed plates; for technical reasons this line of work has not been pursued further.

Ultraviolet rays are very effective against bacteria in fine particles and less so on those on dust, whereas cloth and other filters have a complementary activity, being capable of removing the coarse but not the fine particles. It is therefore possible to make a duct containing lamps

and to pass air by means of a fan first through a dust-retaining cloth filter and then over the lamps. Air almost or wholly free from bacteria can thus be obtained at the exit from the duct. Such a system has been used in a number of trials in operating-theatres; it can be slung out of the way above the surgeon's head and used to direct an almost imperceptible current of clean air on the operation site. A system of lamps in ducts may also be profitably installed in certain places where forced ventilation is already in use, but it is not practicable for immediate adoption in large numbers of shelters, mainly because of the cost of installing and maintaining the apparatus.

BACTERICIDAL MISTS

Bacteria can be killed in the air by means of persistent mists of very fine particles produced by nebulising certain antiseptic solutions with atomisers of special design. Trillat (1938), who introduced them, called such mists "aerosols" but this term has been used in several different senses and will be avoided in this discussion. Although the mechanism of their action is not yet clear, their efficacy probably depends on collision between antiseptic particles and infective droplet nuclei. Much doubt exists as to the factors which determine whether a particular substance shall have bactericidal action when in mist form; there seems to be little relation between such activity and the Rideal-Walker coefficient. It may be said at once that many proprietary substances advocated for use as mists are valueless for the purpose of direct aerial disinfection, and further that devices are often used to put up such mists in public places which fail to produce a mist sufficiently fine to be of any value.

Bacteria vary in their susceptibility to antiseptic mists. Bacterial spores are hardest to kill, and of pathogenic organisms streptococci and staphylococci are more resistant than most gram-negative bacilli. A hæmolytic streptococcus of group C has been used in many of our studies because of its high resistance. A few viruses, including that of influenza, have been found susceptible as judged by the reduction of their infectivity for mice. Bacteria dried or on dust are probably harder to kill than when atomised in a moist form. Tests on the hæmolytic streptococci emitted by infected ferrets show that organisms gaining access to the air from an animal's respiratory tract may be killed by antiseptic mists. As in other examples of antiseptic action, organic material present in the fluid medium containing the organism increases the latter's resistance. Under practical conditions hæmolytic streptococci in the air of wards have apparently been killed by antiseptic mists (Cruickshank and Muir 1940). An effect on other human pathogens has been hard to prove because of the previously mentioned difficulty of identifying and enumerating these in the presence of vast numbers of dust organisms.

Among the few substances which have proved to be of value as antiseptic mists may be mentioned sodium hypochlorite, chloramine-T, resorcinol, hexyl-resorcinol, eugenol carbinol and catechol. The last four of these are most effective when dissolved in propylene glycol, hexyl-resorcinol in propylene glycol possessing especial potency (Twort et al 1940). Antiseptic mists differ in cost, smell, toxicity, as irritants to mucous surfaces in speed of bactericidal action and in effective life (the time during which the mist retains its bactericidal efficiency). For various reasons several of the antiseptics mentioned, including chloramine-T and catechol, may be eliminated. A few good ones remain.

Hexyl-resorcinol in propylene glycol has proved perhaps the most effective under laboratory conditions, but unfortunately neither the antiseptic nor its solvent is at present readily enough available in large amounts to warrant its introduction except for special purposes.

Eugenol carbinol in propylene glycol or in 7·5% glycerol is also effective. It could be made in quantity if necessary since it is a derivative of clove oil; it makes an almost odourless non-irritating mist and so far as our tests have proceeded seems to be non-toxic. Work on the properties of the mist has, however, not yet proceeded far enough to warrant our advocating its widespread use.

Resorcinol in glycerol is effective but must be used in higher concentrations than other substances discussed.

Sodium hypochlorite is agreed to possess many advantages though the mechanism of its action, whether as mist or as hypochlorous acid gas, is in dispute. It is very cheap and is procurable either by electrolysis of sea-water or by chemical means in unlimited amount. Alone among the substances mentioned it is a valuable dedorant, a fact which by itself might make its use desirable under certain conditions, as in ill-ventilated shelters. It has been used in medicine and surgery for so long that one need have no qualms as to possible toxicity in the concentrations used. It is effective in low concentration; 5 c.cm. of a 0·5 or 1% solution sprayed into the air will rapidly kill 95% of streptococci suspended in the air of a room of about 1000 cu. ft. capacity. Preliminary tests indicate that, in the concentrations necessary, damage through bleaching of various fabrics does not readily occur. This matter will have to be watched during more extensive trials; so also will the danger of discoloration or corrosion of metals, which are likely to be affected as they are by sea-water. For this reason it is unwise, as Baker and others (1940) point out, to allow the concentration of sodium chloride in the solution to be too high. Hypochlorite sprays should not be used in the presence of certain electrical equipment such as telephone switchboards.

HOW AND WHEN TO SPRAY

Spraying instruments.—For putting up hypochlorite mists it is necessary to use machines not made of metal; most of those available being of metal will not withstand long use with hypochlorite solutions. Small hand-operated sprayers have a limited applicability—only, in fact, to small rooms or shelters. Larger spaces can be dealt with by foot-operated machines, but for those of over 2000 cu. ft. capacity electrically driven compressors are best unless volunteers for pumping are freely available. Such an electrically operated instrument which can be used with hypochlorite is marketed under the name of Dynalysor. A simpler type of sprayer has been devised at this institute; this can be worked with foot or electrical pumps such as are used for inflating motor tyres. It consists of a nozzle on the ordinary scent-spray principle; the force of a jet of compressed air sucks up fluid from a reservoir and throws out a mixture of coarse and fine droplets. The sprayer is inside a box; a screen above it retains the coarser droplets, allowing only a fine mist to emerge at the top. Two sizes of machine have an output of 1 c.cm. and 4 c.cm. per minute, and are suitable for use, one with a foot pump, the other with an electrical compressor or other supply of compressed air. The machines have been made of ebonite, but other materials may prove to be better. It is desirable to place spraying machines in a natural draught or near a fan to distribute the mist evenly. For spraying solutions containing propylene glycol another type of machine has been devised, capable of nebulising more viscid liquids.

Amount of sprayed solution required.—As already mentioned, a mist made from 5 c.cm. of 0·5 or 1% hypochlorite will kill most of the organisms in 1000 cu. ft. of air (1 part of hypochlorous gas in 1–2 million parts of air). This quantity would have to be nebulised every thirty minutes even where there was no good ventilation in order to keep up an effective concentration. If loss through ventilation were excessive it might be necessary to nebulise continuously. The smell of hypochlorite will usually be just perceptible to those entering a room, but would probably be imperceptible after a short time. A mist causing irritation to conjunctiva or respiratory tract should be regarded as excessive.

Sprays in shelters.—The proper application of sprays to shelters presents problems peculiar to each shelter, depending on their size, configuration and ventilation. Sprays of the type under discussion are designed to kill organisms as they are dispersed into the air from the respiratory tract; they are not the best method of cleaning the air of shelters in the absence of their human populations (apart from the deodorising value of hypochlorites). Antiseptic mists are probably best nebulised in shelters for a short time before they are to be occupied, and the mists should be maintained by repeated spraying from time to time until the inhabitants settle down for the night and again when there is activity in the morning. When there is an epidemic with much coughing or sneezing all-night nebulisation might be necessary.

ORGANISMS ON DUST

The persistence of some organisms in dust (tubercle bacilli, hæmolytic streptococci, diphtheria bacilli) is now well recognised as a source of danger. Certain special cleaning methods mark an advance on those generally in use even including wet sweeping and dusting.

Treatment of floors.—A recent paper by van den Ende, Lush and Edward (1940) from this institute describes how hæmolytic streptococci from an experimentally contaminated blanket may reach the floor and be re-suspended in the air of a room by sweeping. When such an infected blanket was beaten and colony-counts made on plates exposed for ten minutes 5 ft. from the ground a count of 312 was obtained in one experiment. When the dust had been allowed to settle and the room ventilated, the count was down to 2 for a similar period, but during and after sweeping it rose again to 99. In a similar room the floor had been treated with a proprietary dust-layer (Florigene), and the corresponding counts were: after the blanket beating, 435; after ventilation of the room, 2; during and after sweeping, 0. Most of the infective particles thus wholly failed to rise from the treated floor. Similar results were obtained in other tests. Instead of florigene, crude liquid paraffin (spindle oil) could be used with equally good effect; this is readily available in large quantities at a low price. These dust-layers act mechanically by making the dust particles sticky and mutually adherent; instead of being fluffy the dust is matted and is readily swept away without being dispersed into the air. Organisms are not killed by the oil and most antiseptics have in fact no bactericidal action in such an oily medium. Wood, linoleum and cement floors treated with a small quantity of the oil may be slightly slippery for twenty-four hours; after this the surface looks dull but, after a first treatment, remains effective for between three and six weeks, and after subsequent treatments even longer. The oil cannot be used on rubber floors, and highly polished floors may have to have some of the polish removed before the oil will "take" well. The use of spindle-oil has perhaps its greatest application in hospital wards, but danger from dust might be greatly reduced by its use in shelters, factories, offices and other places. As a control measure it is noteworthy for its cheapness and ease of application.

Treatment of bedclothes.—It has long been known that the number of bacteria in the air of hospital wards varies with the state of activity of the occupants and at bed-making times the bacterial counts rise to a peak, owing to the distribution of large numbers of bacteria on minute fragments of textile fabrics which are buoyant and remain in suspension for a long time. In order to reduce the numbers of bacteria distributed from bedclothes two methods are available. The bedclothes can be treated either with suitable antiseptics or with substances designed to reduce the amount of dust liberated. Our laboratory trials have not yet revealed a practicable method of dealing with the problem by treatment of bedclothes with antiseptics, but of the methods designed to reduce the amount of dust one has given sufficiently encouraging experimental results to warrant its trial under working conditions—the application of very small amounts of liquid paraffin as a solution of the oil in white spirit (a petroleum product used in dry cleaning).

Woollen blankets soaked in a 30% solution and then freed from excess by centrifugation in a hydro-extractor retain approximately 3% of their weight of oil, but are nevertheless not perceptibly oily to the touch; they are in fact almost indistinguishable from untreated blankets. The shaking or beating of "oiled" blankets results in the liberation of only a small amount of dust and this consists entirely of large fibre fragments which settle rapidly to the floor. Control blankets similarly beaten liberate much more dust, consisting of minute fragments of fibre or wool scales which remain suspended in the air for a long period. Counts on blood-agar plates exposed in rooms in which naturally or artificially infected blankets were shaken showed corresponding differences. This reduction in the bacterial counts was observed if the blankets were artificially infected with a coarse spray of hæmolytic streptococci or *Staphylococcus albus* in serum broth, or with a mixture of dry streptococcus powder and fine carpet dust.

The dust-laying power of the oil varies on different textiles. In a typical experiment with coarse blankets, plates exposed for five minutes during and after beating showed 170 colonies in the case of the oiled blanket and 1030 with the control. For a second five-minute after-period the plate counts were 9 and 280 respectively. The results were even more striking in experiments with pure woollen materials such as serge and "all-wool" blankets. With the latter a reduction of as much as 95% has been obtained. On the other hand, with cotton sheets the reduction of dust and bacterial counts, though significant, was less striking; this is probably at least partly due to the fact that the amount of dust normally liberated from sheets is less than that which is obtained from woollen blankets. Besides being highly effective, liquid-paraffin treatment has the advantage of being inexpensive and of requiring no more elaborate apparatus than that in every day use by dry cleaners or launderers.

Conclusion

We have discussed certain methods for the control of respiratory disease; none of these is of proved efficacy in the field, though all of them have given encouraging results in the laboratory. What justification is there for urging the use of methods of such unproven value? Only this: that our means of controlling respiratory disease in the past have certainly been inadequate. The unprecedented conditions of life in a large part of Britain during this winter may be expected to swing the odds in the struggle between man and his respiratory pathogens still more heavily in favour of the bacterial forces. An ordered plan of defence is more necessary than ever before. Our weapons of defence include the improvement of ventilation, masks, ultraviolet light, antiseptic mists, paraffining of floors and blankets. Which of these is best employed in any set of conditions is a tactical problem for the medical man in charge. In many instances it will be advisable and even necessary to combat simultaneously the three dangers of droplets, droplet nuclei and dust.

Summary

Air-borne infection may be conveyed (1) in large droplet projectiles sprayed short distances from the mouth or nose; (2) in droplet nuclei which may float in the air for long periods; and (3) on dust.

Adequate spacing and ventilation are the most important counter-measures whatever the route of spread. Small- and large-scale investigations have been made into the efficacy of other measures which may be applied when these are impracticable.

Spread by large droplets may be controlled (1) by isolation of infected persons; (2) by screens between the heads of neighbouring sleepers; and (3) by masks, of which one made of transparent cellulose acetate is comfortable, effective and cheap, though unsuitable for wearing at night. Masks should be worn during the daytime by workpeople and occupants of shelters who have colds and by all occupants of public places during influenza epidemics. In shelters those with coughs should wear a gauze mask at night.

Ultraviolet light is highly effective against organisms in droplet nuclei but much less so against organisms on dust. Where forced ventilation is in use the issuing air can be rendered almost sterile by passing it through a cloth filter and between ultraviolet lamps. The cost of installation renders the general use of ultraviolet light impracticable in shelters at the moment.

Of several bactericidal mists effective against suspended organisms a mist of sodium hypochlorite is cheap, harmless in low concentrations, almost odourless and a powerful deodorant. Sodium hypochlorite corrodes metal, but suitable non-metallic sprayers are available, worked either electrically or by a foot-pump. Small shelters should be sprayed before the occupants assemble, every half-hour before they settle down for the night, and again in the morning. In an epidemic spraying may have to be repeated every half-hour during the night. It may be necessary to spray large shelters more or less continuously.

Dust on floors can be prevented from rising by treating the surface once a month with spindle oil (crude liquid paraffin). Blankets can be prevented from dispersing their dust by soaking them in a 30% solution

of liquid paraffin in white spirit, and this will not make them feel oily.

REFERENCES

Baker, A. H., Finn., S. R. and Twort, C. C. (1940) *J. Hyg., Camb.* **40**, 560.
Buchbinder, L., Solewey, M. and Solorovsky, M. (1938) *Amer. J. publ. Hlth*, **28**, 61.
Cruickshank, R. and Muir C. (1940) *Lancet*, **1**, 1155.
Garrod, L. P. (1933) *St. Bart.'s Hosp. med. Rep.* **66**, 203.
Gordon, M. H. (1902–03) *Local Government Board, Annual report of M.O.H.* **32**, 421.
Hollaender, A. and Dalla Valle, J. M. (1939) *Publ. Hlth Rep.* **54**, 574.
Trillat, A. (1938) *Bull. Acad. méd. Paris*, **119**, 64.
Twort, C. C., Baker, A. H., Finn, S. R. and Powell, E. O. (1940) *J. Hyg., Camb.* **40**, 253.
Van den Ende, M., Lush, D. and Edward, D. G. ff. (1940) *Lancet*, **2**, 133.
Wells, W. F. and Wells, M. W. (1926) *J. Amer. med. Ass.* **107**, 1698, 1805.
Wells, W. F., Wells, M. W. and Mudd, S. (1939) *Amer. J. publ. Hlth*, **29**, 863.

EFFECTS OF SERUM AND SALINE INFUSIONS

QUANTITATIVE STUDIES IN MAN

BY D. K. HILL,* B.A. Camb.
J. MCMICHAEL, M.D. Edin., F.R.C.P.E., and
E. P. SHARPEY-SCHAFER, M.R.C.P.
With technical assistance of A. C. PINCOCK
(*From the Department of Medicine, British Postgraduate Medical School*)

ACCURATE knowledge is needed of the effects of various types of infusions recommended in the treatment of hæmorrhage and shock, both of which conditions are characterised by a depletion of the volume of circulating blood. Although the basic phenomena of shock were reasonably well understood in the last war, the quantitative aspects of treatment have not yet been adequately studied.

MATERIAL AND METHODS

Observations have been made on healthy adult males as well as in cases of circulatory collapse. For the latter studies the best material was found to be patients who had undergone operation, with or without extensive loss of blood. Two cases of uncomplicated traumatic shock have been studied. Blood-volume was determined in the normal people by a modified carbon-monoxide method, and in the shocked patients by a new method, which will be described in a separate paper. It was found that a close inverse relationship existed between blood-volume and hæmoglobin, as suggested by Robertson (1935). While rapid changes of blood-volume are taking place after hæmorrhage has ceased or after infusions of serum or saline, the corpuscular content of the circulating blood remains constant—i.e., these rapid changes of blood-volume are due to alterations in the amount of plasma. Hæmoglobin was estimated at first by the Haldane method, and in later experiments by a photoelectric method. A Haldane hæmoglobinometer generally gives sufficient accuracy for detection of the degree of change usually observed. Blood-pressure and pulse-rate were also recorded. The solutions injected were: (1) normal saline; (2) four-times normal saline; (3) four-times concentrated reconstituted dried serum; (4) serum-saline (Clegg and Dible 1940) and; (5) plasma.

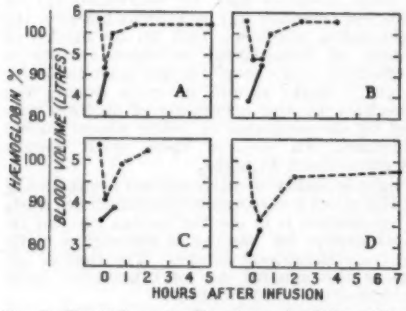


FIG. 1—Rapid loss of saline from circulation after intravenous infusion in normal people: A, B, C, 1000 c.cm. of normal saline; D, 200 c.cm. of a 3·6% solution of sodium chloride (four-times normal); circles, hæmoglobin; squares, blood-volume; zero hour marks the end of the infusion.

INFUSIONS IN NORMAL ADULTS

The changes in blood-volume after infusion were followed by hæmoglobin estimations and in some cases directly.

Doses of 1000 c.cm. of normal saline or smaller quantities of a 3·6% saline solution have been given intravenously to 6 normal people. The further dilution of circulating blood due to hypertonic infusions takes place so rapidly that the effect is essentially similar to that resulting from the infusion of an equivalent quantity of normal saline. Fig. 1 † shows that saline is lost very rapidly from the circulation. Even when the blood-volume is measured as soon as possible after the infusion the increase is considerably less than the volume of fluid added to the circulation.

Doses of 200 c.cm. of four-times concentrated serum (prepared from dried serum) were given to 3 normal people (fig. 2 A, B, C). The dilution of the blood, equivalent in each case to an increase in blood-volume about four times as great as the volume of serum injected, is seen to be maintained for long periods, in 2 cases for days. The third case was not followed for more than seven hours.

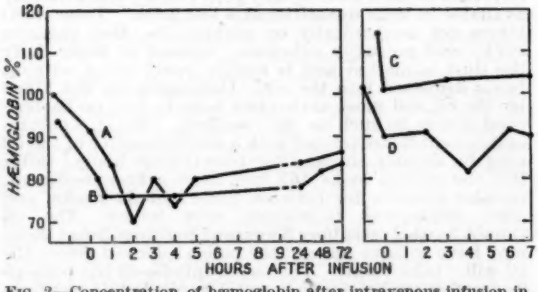


FIG. 2—Concentration of hæmoglobin after intravenous infusion in normal people: A, B, C, 200 c.cm. of concentrated (four-times normal) serum; D, 1000 c.cm. of normal serum; zero hour marks the end of the infusion.

The effect of infusion of 1000 c.cm. of serum saline into a normal person is shown in fig. 2 D. The blood-volume was not measured; but a value of 5 litres being assumed, the dilution of the blood at 6 hours suggests that about half of the litre infused remained in circulation. In the treatment of shocked patients it has been our experience that the initial dilution of the blood after the transfusion of serum-saline is followed rapidly by reconcentration corresponding to a loss of about 40–50% of the added fluid. The protein content of the serum-saline is about 60% of that in normal plasma (the low value is due to dilution with saline citrate), and it seems that infusion is followed rapidly by the loss from the circulation of sufficient non-protein fluid to restore the colloid-osmotic pressure to its original value. The infusion of quantities of fluid as great as 1000 c.cm. into normal people is not attended by any rise in blood-pressure, even though the added fluid is retained in circulation.

The cases described in this paper are only a selection of those in which concentrated serum and serum-saline have been given. Besides the examples recorded, four-times concentrated serum has been given in doses of 50–300 c.cm. to 23 people, 9 of whom were of an incompatible blood-group, and 1000 c.cm. of serum-saline was given to 6 people. No serious reactions took place.

INFUSIONS IN CIRCULATORY COLLAPSE

CASE 1.—Man, aged 56, partial gastrectomy and resection of adjacent viscera for carcinoma. This patient was given

* Working for the Medical Research Council.

† The time scale in most of the charts had to be compressed after the first few hours, in order to show the rapid changes in the early stages and the slower adjustments later. This has been done in an arbitrary fashion to illustrate as well as possible the essential data. "Serum" in the charts refers to serum-saline.

saline only. The pulse-rate continued to rise for 20 hours, and the systolic and pulse pressures, after improving slightly during the period of intravenous saline drip, fell. Subsequently spontaneous improvement took place accompanied by dilution of the blood (see fig. 3).

This case brings out the transient effects of saline infusion. Until blood-volume is restored by maintained dilution of the blood, recovery does not take place.

CASE 2.—Woman, aged 48. Radical mastectomy with considerable hæmorrhage. Intravenous saline raised blood-pressure and slowed the heart only temporarily. Blood and serum raised blood-pressure and slowed the heart, and these changes were maintained (see fig. 4).

This case emphasises the fleeting improvement produced by saline and brings out by contrast the maintained effects of blood and serum transfusions.

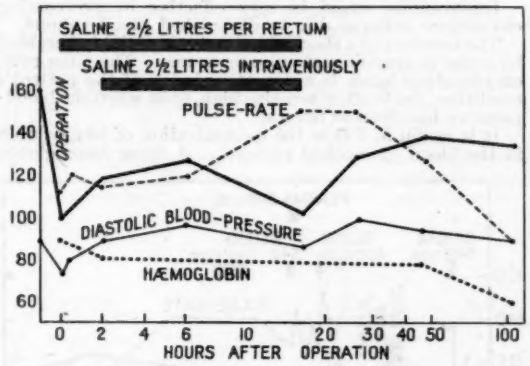


FIG. 3—Effects of infusion of saline after partial gastrectomy and resection of adjacent viscera for carcinoma (case 1). Upper continuous line = Systolic B.P.

CASE 3.—Woman, aged 36. Attempted nephrectomy accompanied by great loss of blood. Intravenous infusion of 1600 c.cm. of serum-saline raised the blood-pressure by 60 mm. Hg. The blood-pressure was maintained, as was the dilution of the blood (see fig. 5).

CASE 4.—Man, aged 58. Internal hernia with blood-stained peritoneal exudate. Resection of 9 ft. of ileum. Postoperative circulatory collapse, with maintained benefit after a litre of plasma (fig. 6). Further progress uninterrupted.

Cases 3 and 4 further illustrate the maintained improvement resulting from the transfusion of serum.

CASE 5.—Woman, aged 44. Radical mastectomy. The loss of blood at operation was 1640 c.cm. (estimated by soaking out swabs). The initial dose of serum raised the blood-pressure, but the pulse-rate began to mount. Seven hours after operation the patient collapsed, with an imperceptible pulse. Intravenous saline had an inadequate effect, and it was not until 1000 c.cm. of serum was given that the blood-pressure seemed to be satisfactorily restored. The improvement was not maintained, and the patient died some hours later (fig. 7). Necropsy showed dry exsanguinated viscera, and death was due to the circulatory collapse resulting from hæmorrhage.

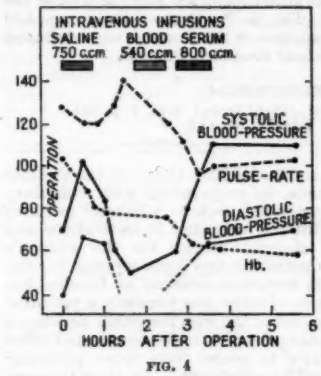


FIG. 4

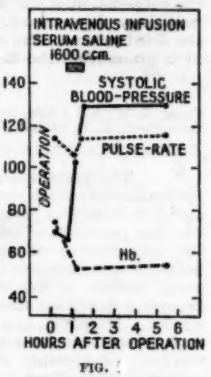


FIG. 5

FIG. 4—Effects of infusions of saline, blood, and serum after radical mastectomy with considerable hæmorrhage (case 2).

FIG. 5—Effects of infusion of serum saline after attempted nephrectomy accompanied by great loss of blood (case 3).

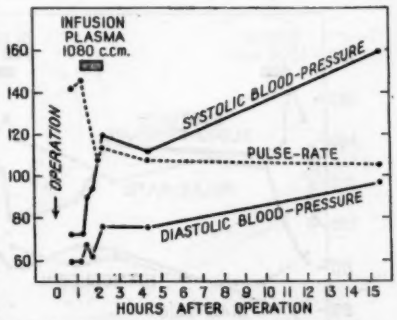


FIG. 6—Effects of infusion of plasma after operation for internal hernia with bloodstained peritoneal exudate (case 4).

Case 5 is especially important, because the patient might have been saved by more adequate treatment. The patient's blood belonged to group II, and this was the first patient to whom we transfused serum from the theoretically incompatible group IV. For this reason we hesitated to give more than one bottle until we had watched for possible ill effects. During this period of watching circulatory collapse took place, and the patient died in spite of a temporary rise in blood-pressure produced by a litre of serum. Necropsy showed no evidence of intravascular hæmolysis or other deleterious effects of incompatibility, and, from this fact and our experience with other subjects we are satisfied that incompatible serum can be used safely in large quantities. Other points that arise from this case are (1) that partial restoration of the blood-pressure is useless; transfusion must be continued until the blood-pressure is at least 100 mm. Hg and preferably higher; and (2) that the late restoration of blood-pressure to a normal level may not be maintained.

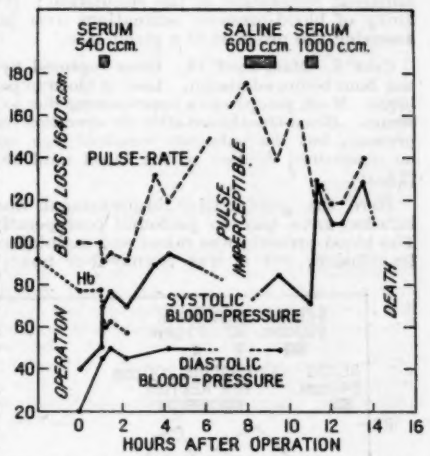


FIG. 7—Effects of infusions of saline and serum after radical mastectomy accompanied by a loss of 1640 c.cm. of blood (case 5).

CASE 6.—Man, aged 50. Difficult gastrectomy for penetrating ulcer. This patient was given a litre of serum which appeared to be retained for a few hours. Later, however, the systolic and pulse pressures fell, the pulse-rate rose, and there was concentration of the blood. An infusion of 540 c.cm. of blood produced benefit, which was maintained (fig. 8).

The partial recovery from circulatory collapse after the infusion of a litre of serum was not maintained for more than about three hours, and a further infusion was required later.

CASE 7.—Boy, aged 12. Kidney ruptured by lorry wheel three hours before infusion was begun. Initial shock profound. The improvement due to the first transfusions of blood and serum was not maintained, and shock again increased parallel with concentration of the blood. Two

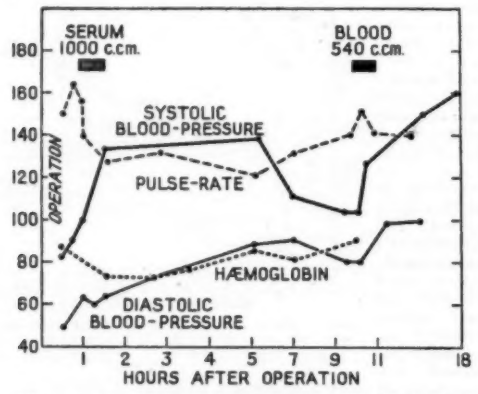


FIG. 8—Effects of infusions of serum and blood after gastrectomy (case 6).

doses of four-times concentrated serum caused improvement, which was maintained. There was dilution of the blood and the blood-pressure rose. Note the high pulse-rate (fig. 9).

Case 7 is an instance of true traumatic shock. It is important to notice that the immediate restoration of blood-pressure was not maintained, progressive concentration of the blood accompanying the subsequent fall of blood-pressure. Later injections of serum, however, were followed by maintained improvement. A similar fall of blood-pressure after the initial treatment is noted in case 6. Points worth emphasis from these two cases are therefore :—

(1) The need for frequent observations of blood-pressure and hæmoglobin in cases of shock, even after apparent restoration of the circulation ; (2) the superiority of blood-pressure estimations over pulse-rates in assessing the progress of a given case.

CASE 8.—Man, aged 18. Liver ruptured by lorry wheel one hour before admission. Loss of blood in peritoneum 2·4 litres. Much preoperative improvement due to 540 c.cm. of serum. Blood-transfusion after the operation restored blood-pressure, but the pulse-rate remained high, and there was no maintained dilution of the blood until 48 hours later (fig. 10).

Here the preoperative improvement due to serum infusion gave way to profound postoperative collapse. The blood-pressure was raised and maintained by blood-transfusion, but it was twenty-four hours before the pulse-rate began to fall and the fall in hæmoglobin did not begin until 36 hours after the accident.

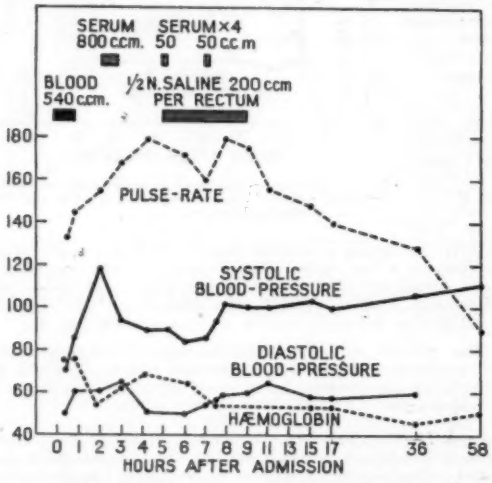


FIG. 9—Effects of infusions of blood, concentrated serum, and saline in traumatic shock due to crushed kidney (case 7).

SUMMARY

Observations of hæmoglobin concentration, blood-volume, and blood-pressure were made before and after infusion with normal saline, hypertonic saline, serum, or concentrated serum in normal people and in patients with postoperative and post-traumatic shock.

Physiological or hypertonic saline given intravenously to normal people is rapidly lost from the circulation.

Serum given intravenously to normal people is retained in the circulation for long periods. The rise in blood-volume depends on the total quantity of protein added, and is independent of the dilution of serum employed.

In shocked patients intravenous saline produces transient benefit only.

Intravenous serum is very effective in overcoming circulatory collapse due to diminished blood-volume.

The recovery of a shocked patient is invariably heralded by a rise in systolic and pulse pressures. The pulse-rate, on the other hand, is a deceptive index of the patient's condition, for it often remains high, even when the blood-pressure has risen to normal.

It is useful to follow the concentration of hæmoglobin in the blood of shocked patients. A rising hæmoglobin means a falling blood-volume, and precedes a deterioration in the patient's condition. Recovery can be forecast if the hæmoglobin is falling, meaning that the blood-volume is being spontaneously restored by dilution of the blood. The retention of infused serum or saline can be gauged by estimating the hæmoglobin.

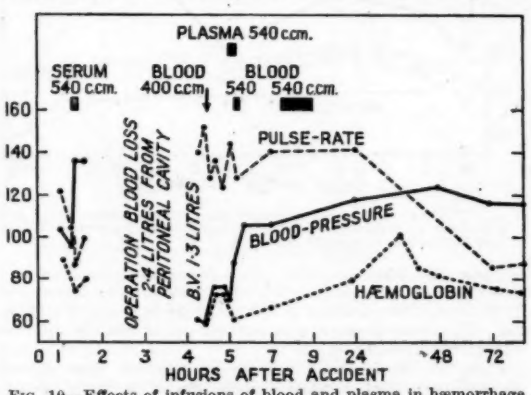


FIG. 10—Effects of infusions of blood and plasma in hæmorrhage due to to rupture of liver (case 8).

We are indebted to the Chief Medical Officer of the L.C.C. for permission to publish this study. We also acknowledge the coöperation of our surgical colleagues and the staff of the pathology department. Dr. A. N. Drury kindly supplied the dried serum. The expenses of the research were defrayed by a grant from the Medical Research Council.

REFERENCES

Clegg, J. W. and Dible, J. H. (1940) *Lancet*, Sept. 7, p. 294.
Robertson, J. D. (1935) *J. Physiol.* **84**, 393.

"... The introduction of the Welfare Office on the Victoria Embankment which assists, in coöperation with voluntary agencies, homeless persons to get back to a normal mode of life, the provision of additional amenities in institutions and the introduction of an almoner service for the council's hospitals are instances illustrating how consideration for the social welfare of the less fortunate citizens of London has become a dominant feature of what was formerly a poor-law service. Moreover, as a result of the war, the public assistance department is now organising the rest centre service and other services considerably wider in scope than those generally connoted by the term 'public assistance.' In these circumstances we consider that a more appropriate name for the Public Assistance Committee would be the 'Social Welfare Committee.'"—From a report presented to the L.C.C. on Dec. 17.

OPERATION FOR PENOSCROTAL HYPOSPADIAS

By David Levi, M.S. Lond., F.R.C.S.
SENIOR SURGEON TO THE INFANTS HOSPITAL, VINCENT SQUARE, LONDON

THE following procedure for the relief of penoscrotal hypospadias has given more satisfactory results than has any other known to me. There are three stages of the operation.

STAGE I

The foreskin is buttonholed; the slit is made as near the glans and as long as possible. When this has been done the foreskin should be attached to the penis by two small pedicles. The incisions are carefully and accurately sutured, the incision in the mucosa round the glans being sutured to the skin of the penis, and the mucosa round the cut periphery of the foreskin sewn to the subjacent skin on the dorsal aspect of the foreskin. The corpus spongiosum is excised from the ventral aspect of the penis, the dissection being carried down round the urethral orifice. The penis is thus freed. The urethra should be allowed to slip back as far as it will when the penis is held flat against the anterior abdominal wall. The skin incision on the ventral aspect of the penis is then sutured.

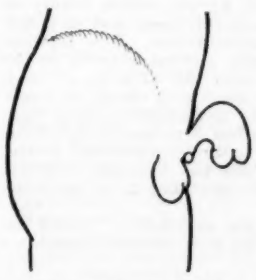


FIG. 1—The curve in the penis in penoscrotal hypospadias.

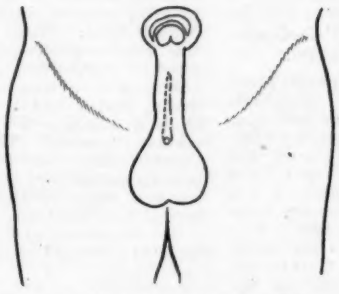


FIG. 4—Ventral aspect of penis after fibrosed corpus spongiosum has been dissected out and removed and urethra allowed to find its natural position.

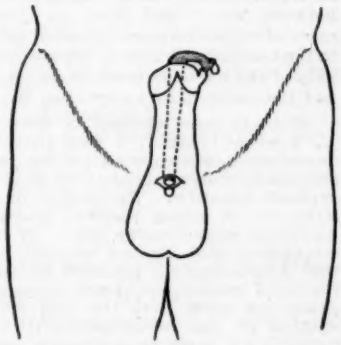


FIG. 7—Foreskin, which is now a pedicle graft with an epithelial lining, thrust down penis to protrude immediately anterior to urethral opening.

STAGE II

Two or three months are allowed to elapse before operating again. The second stage should not be undertaken unless the fibrosis and scar tissue resulting from the first operation have disappeared and the original incision is thin and supple. There should be no residual induration. The foreskin should be detached from one end. An incision is now made halfway across the circumference of the attached end of the foreskin; sinus forceps are inserted into this incision and pushed along the tube of foreskin to emerge at its cut free end. The interior of the tube of foreskin is now dilated. After this has been done, it is a simple matter to turn it inside out; the sinus forceps are thrust through the basal incision along the interior of the foreskin, and the distal extremity is seized; the forceps are withdrawn, and the skin follows them. The result is an epithelial-lined tube attached at one end to the penis at the side of the glans. A sharp long thin-bladed tenotomy knife is now thrust into the body of the penis immediately anterior to the urethral orifice and made to emerge at the extremity of the glans at the point where the normal urethra should open. Through the incision thus made the tube of foreskin is pulled. Suprapubic puncture and catheterisation are performed, and the child is sent back to bed. In fourteen days the suprapubic catheter is removed and the attachment of the foreskin to the side of the penis cut and trimmed. As a result of this procedure, there is a new wide urethra running down the centre of the penis. Two or three months are again allowed to elapse till the inflammatory reaction inevitable to the healing process has passed.

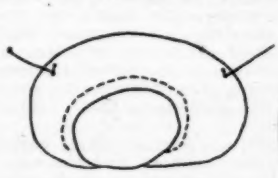


FIG. 2—Glans penis and foreskin held out, showing line of incision.

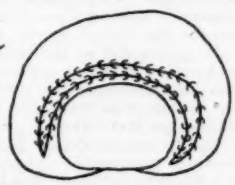


FIG. 3—Glans penis with foreskin sutured.

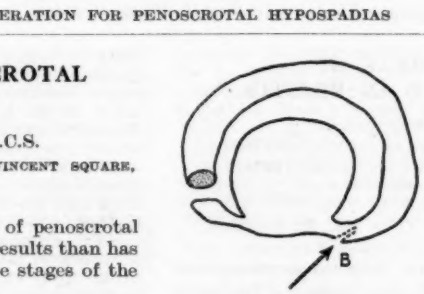


FIG. 5—Stage II of operation; one end of foreskin detached and incision made in opposite pedicle.

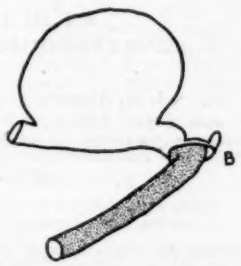


FIG. 6—Foreskin turned inside out through incision B.

STAGE III

This consists of uniting the epithelial tube of the new urethra to the opening of the urethra proper. Again a suprapubic puncture is performed and a catheter introduced into the bladder. With the child under general anæsthesia, procaine and adrenaline are injected into the skin on the ventral aspect of the penis round the two orifices to be united; this ensures a bloodless field. If stage II has been properly planned, it will only be necessary to form the ventral aspect of the urethra afresh. The dorsal aspect is complete. An incision is made in the mucocutaneous junction of the urethra on its ventral aspect and is continued round the opening of the new urethra. The mucosa of the urethra is now sutured to the corresponding layer in the new urethra. This should be done transversely and with the Connell type of stitch. The incision in the skin is sutured longitudinally. The skin edges must be well everted. The suprapubic catheter is removed on the fourteenth day.

AN OUTBREAK OF PARATYPHOID B IN BRISTOL

BY

I. G. DAVIES
M.B. LOND., M.R.C.P., D.P.H.
DEPUTY MEDICAL OFFICER OF HEALTH FOR BRISTOL

J. WISEMAN
B.SC. EDIN.

AND

K. E. COOPER
B.SC., PH.D. LEEDS, M.R.C.S.
SENIOR BACTERIOLOGIST

J. M. DAVIES
B.SC. EDIN.
ASSISTANT BACTERIOLOGISTS

(From the Department of Preventive Medicine, University of Bristol)

MANY factors combine, under war conditions, to increase the chances of outbreaks of enteric fever or food poisoning, but in recent years improved methods of laboratory diagnosis have become more widely used. Some of the changes resulting from improved technique—for instance the value of fæcal examinations during the earliest days of enteric infection—have not been sufficiently recognised. Partly for this reason and partly to show the importance of confectionery in the spread of infection, it seems worth recording the results obtained in an outbreak which occurred in Bristol this year between May 7 and June 16. During this period 43 cases of suspected paratyphoid B infection were reported to the health department. We investigated them with the help of the senior housing inspector, Mr. F. J. Redstone, and the senior dairies inspector, Mr. H. M. Gould.

Of the 43 cases reported, 30 proved to be paratyphoid B, 2 were typhoid, 3 food-poisoning by salmonella organisms and 8 were simple diarrhœa. The following account is concerned only with the cases of proved paratyphoid infection. The article of food involved was found to be cream pastries, prepared and sold by a wholesale confectionery firm. Of the 30 cases, it was established that 19 had certainly eaten pastries from this shop during the probable period of infection. In a further 7 cases it could not be proved that the pastry eaten had come from the firm concerned, but in the opinion of the investigators it was likely. In the remaining 4 cases no connexion could be established. Of the 4 cases outside Bristol, 3 were definitely traced to pastries from this source, and the fourth was probably so caused. It was impossible to determine whether the cream was infected during preparation or whether the cream pastries were infected as such after manufacture; since the cream was prepared on the premises, the same persons might have been involved in either case. The process of cream-making appeared to offer maximal opportunities for infection, and no pastries other than those containing cream were implicated, so that infection of the cream during preparation seems probable, but could not be proved.

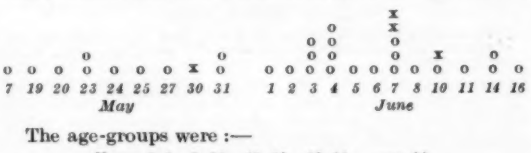
Investigation of the workpeople employed by the firm revealed a carrier who handled the pastry concerned. *Bact. paratyphosum* B was isolated from the stools of this carrier on June 24. A second food handler gave a positive agglutination with *Bact. paralyphosum* B in a dilution of 1/50—but no organism could be isolated from the stools. A third employee, also a food-handler, proved to have organisms of the salmonella group present in the stools. All three were removed to hospital. It is significant that the positive fæcal excreter was at work up to May 28 and cases were reported only up to June 16—that is, 19 days later. On the assumption that she had been an ambulant case previous to May 28, it would mean that she was a reasonable cause of the crop of cases occurring up to June 16. Although she was back at work between June 11 and June 25 we were only able to obtain one positive fæces on June 24, subsequent examination being negative. Thus, by this time, in all probability she had become a very sparsely intermittent carrier and thus caused no further extensive infection.

EPIDEMIOLOGICAL INVESTIGATION

Geographically the cases were scattered throughout the city and no particular district was heavily involved. This scattering was at first puzzling, especially when it became apparent that water, milk and ice-cream could not be incriminated. The regular weekly water analysis made by the laboratory and close coöperation with the Bristol Water Company quickly established the fact that water was extremely improbable as the source of the outbreak, apart from the fact that there was none of the characteristic explosiveness of a water-borne epidemic. Milk and ice-cream were next investigated particularly as there was a relatively large proportion of very young children among the cases. Careful investigation showed no common factor among the cases in relation to either milk-supply at the farm or at the retailer. In the same way ice-cream failed to reveal itself as a common factor although it was highly suspect on general grounds owing to the age of the patients and the season of the year. At this stage we were reluctant to abandon it as a source (90 ice-cream and 60 milk samples were examined bacteriologically). As a working rule an incubation period of 14 days had been adopted in calculating the probable period of infection in each case. This was extended to 21 days and shortened to 7, but this revealed no common factor in relation to milk or ice-cream.

Concurrently with the above, a routine investigation of food had been going on and the families affected had been questioned about articles of food consumed during the probable period of infection. The replies received by our house-to-house investigation were not very satisfactory so we adopted the following plan: an exhaustive list of foods was compiled and a copy left in the evening at each house affected with instructions to fill it in after careful consideration by the whole family in consultation. These lists were collected next day and the results exceeded our expectations. The families affected coöperated excellently and a common factor emerged in a number of cases. In at least 5 cases cream pastry had been consumed and shown to come from a common source. The investigation now proceeded smoothly. The suspected firm was visited by a medical officer and with the willing coöperation of the management every employee was blood tested for Widal reaction and a specimen of fæces obtained for bacteriological investigation.

The frequency of the cases was as follows. (Dates are those of onset of illness. Bristol cases o, outside cases x.)



The age-groups were:—

Years	2–5	5–10	10–15	15–20	over 20
Cases	10	4	3	8	5

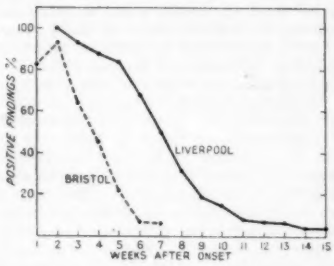
BACTERIOLOGICAL INVESTIGATION

Over 500 specimens (foodstuffs, fæces, sera) were examined during the course of the epidemic. The use of tetrathionate broth (Schäfer 1934–35) for concentrating the paratyphoid bacillus was an invaluable means of isolation. It was shown in the Liverpool epidemic (Glass and Wright 1937) that this method gave a high percentage of positive results in paratyphoid cases, especially during the *early* weeks of the disease—so that during the first 2 weeks the diagnosis was more likely to be successful as the result of examining fæces than by performing a Widal agglutination on the patients' serum. That is contrary to the teaching of most textbooks, and is due to the superiority of this medium to that of direct plating on McConkey.

The examination of foodstuffs was also made easier, because reasonably large quantities of material could be placed in flasks of this liquid medium, or considerable amounts of washings from such bulky materials as lettuces and tomatoes could similarly be added. The investigation of the cream pastries presented difficulties. The examination of several grammes of synthetic cream from even 50 different pastries is probably a very inadequate sample of the material distributed by the firm, who prepare some 4000 pastries each day. In addition, infection would in all probability be intermittent and incomplete. Abundant evidence of fæcal contamination was obtained

as *B. coli*, *B. proteus* Morgan and *Strept. fæcalis* were all isolated. But even this contamination could not be proved to be of human origin, because similar organisms were obtained from an egg-powder ("chinese eggs") used to make the synthetic cream. These organisms probably came from the birds laying the eggs, and served to obscure any subsequent human contamination. An egg-powder from another firm gave on one occasion an organism of the salmonella group, identified by Dr. W. M. Scott as a relative of *Salmonella thompsoni* similar to one isolated from duck eggs. As a result of these difficulties we failed to isolate *paratyphosum* B from the cream.

The epidemiological evidence suggesting infection by the pastry was on the other hand very strong, so that full examination of the workpeople was undertaken. The use of the Widal reaction as a means of detecting enteric carriers has received much support in the literature (Pijper and Crocker 1937). Whether a routine agglutination reaction is always capable of detecting them seemed to us doubtful in view of the fact that the carrier in the Liverpool epidemic (Frazer, Glover and Glass 1937) had a titre of only 1/20 for *Bact. paratyphosum* B (H) and was negative at this titre for *Bact. paratyphosum* B (O). This suspicion was confirmed by the isolation in the Bristol epidemic of organisms from a carrier with a negative agglutination reaction (lowest titre 1/25) for T.A.B. (H) and T.B (O). This carrier was taken into hospital but the fæces became negative and despite repeated examination have remained negative since. The Widal was repeated later but remained negative. Probably the patient was a mild case rather than a true carrier.



The possibility of infection with little result so far as agglutinins are concerned is illustrated by the infection of one family with the following results. The child was taken ill on June 4; on the following 11th the organism was isolated from the fæces and the Widal gave agglutination of *paratyphosum* B (H) at 1/125. On June 14, the fæces and blood of the parents were obtained. The mother was said to have had diarrhœa on the 4th and the father was said to be well. *Paratyphosum* B was isolated from both fæces and was agglutinated by H and O specific antisera. The Widal of the father was positive at 1/50 for *Bact. paratyphosum* B (H) but that of the mother was completely negative. A month later she agglutinated *Bact. paratyphosum* B (O) to 1/125, *B. typhosus* (O) to 1/50 but was still negative for *Bact. paratyphosum* B (H) 1/12.

Another point brought out by this investigation in regard to the interpretation of the Widal reaction was that the occurrence of (O) agglutination in the absence of (H) does not always mean typhoid-paratyphoid infection. Two cases of *B. aertrycke* infection gave titres of 1/125 with *B. typhosus* (O), were negative for *B. typhosus* (H) and *Bact. paratyphosum* B (H) and agglutinated *B. aertrycke* suspensions at dilutions of 1/125 and 1/250 respectively (H and O).

In some cases considerable cross-agglutination with typhoid (H) suspensions (Wyllie 1937) was observed, titres as high as 1/250 being obtained (*Bact. paratyphosum* B (H) 1/1250, in this case). All suspensions used in the laboratory are Oxford standard suspensions.

Fæces were obtained as early as possible from all cases and suspects. They were examined by the tetrathionate concentration method and then plated on McConkey. The percentage of positive findings at varying intervals after the date of onset of illness for proved cases reveals some interesting features (see figure). From 1 to 7 days after onset the percentage positive was as high as 83% and from 8 to 14 days 93%. These high percentages, occurring so early, agree with the results obtained in the Liverpool epidemic (Glass and Wright, 1937). Our percentage then fell rapidly, being only 20% in the fifth week. These cases have evidently become negative much more rapidly than in the Liverpool epidemic, where a similar figure was only obtained after an interval of 9 weeks. Whether this was the result of varying virulence or due to differences of treatment is a matter of supposition. Differences of efficiency in the technique of isolation can scarcely be the explanation, for we obtained almost as high a percentage in the second week as Glass and Wright (actually, only 1 case was negative).

Days	*1–7*	*8–14*	*15–21*	*22–28*	*29–36*	*37–44*	*>44*
Total cases	6	15	14	13	27	28	29
No. positive	5	14	9	6	6	2	2
Percentage	83	93	64	46	22	7·1	6·9

SUMMARY

Patient verbal inquiry gave no clue to the source of infection. It was not until the whole family had pondered at leisure with the aid of an exhaustive food questionnaire that clues were obtained.

The value of early examination of fæces by the tetrathionate concentration method is fully confirmed by our results. The limitations of the Widal reaction are discussed.

Over 200 contacts were visited and investigated but there was no instance of a secondary case arising by contact. The whole outbreak appears to have arisen from the consumption of infected cream in each of the cases reported.

We wish to record our thanks to Dr. R. H. Parry, M.O.H. Bristol, for permission to publish, and to Prof. W. W. C. Topley and Dr. W. M. Scott for much helpful criticism.

REFERENCES

Frazer, W. M., Glover, B. T. J. and Glass, V. (1937) *Brit. med. J.* **2**, 369.
Glass and Wright, H. D. (1937) *J. Path. Bact.* **45**, 431.
Pijper, A. and Crocker, E. G. (1937) *J. Hyg., Camb.* **37**, 332.
Schäfer, W. (1934–35) *Zbl. Bakt.* **133**, 458.
Wyllie, J. (1937) *J. Hyg., Camb.* **37**, 70.

AGRANULOCYTOSIS AFTER SULPHAPYRIDINE THERAPY

WITH RECOVERY

BY J. E. G. PEARSON, B.M. Oxfd, M.R.C.P.
ASSISTANT PHYSICIAN IN THE E.M.S.; AND
A. A. G. LEWIS, B.Sc., M.B. Lond.
HOUSE-PHYSICIAN IN THE E.M.S.

THE following case-history is recorded partly because agranulocytosis is still relatively rare after treatment with sulphapyridine, but chiefly because recovery took place after complete or almost complete agranulocytosis for 4 days. In the previously recorded cases, of which we have been able to trace 13, no patient survived who was proved to be in this precarious state for more than 2 days.

CASE-HISTORY

A married woman, aged 52, was admitted to Mount Vernon Hospital on May 14 with bronchopneumonia at both bases. The sputum contained moderate numbers of pneumococcus, streptococcus and *Micrococcus catarrhalis*; pneumococcal typing was not performed. Blood-count; white cells, 27,500, with 92% polymorphs. She was given moderate doses of sulphapyridine, and her temperature fell but subsequently became swinging. The drug was continued until May 27, when the white-cell count was slowly falling and she had developed a morbilliform rash on the arms, neck, thighs, and buttocks. At that time she had had 43 g. of sulphapyridine in all. The rash faded within 12 hours, but next day she developed a sore throat. The temperature remained normal for 4 days, but the white-cell count fell progressively. On May 31 sodium nucleinate 2 c.cm. (5% solution) was injected intramuscularly; this dose was repeated on the 2 following days. On June 2 the patient appeared desperately ill, the temperature again rising steeply; although she managed to take fluids by mouth in small quantities throughout this period, she afterwards remembered nothing of her condition

for the next 3 days. On the 3rd only 2 basophil polymorphs were seen out of 70 white cells counted in a blood-film; for the next 2 days there was complete agranulocytosis. On the 6th only an occasional granulocyte could be found. Intramuscular injections of pentnucleotide were started on June 3 and continued for 4 days in heroic dosage, the total exceeding 400 c.cm. An initial intravenous injection of 10 c.cm. was also given, and a blood-transfusion of 1 litre was administered by the drip method. The fluid intake was maintained by drip rectal glucose-saline. On the 8th the white-cell count was 26,500; granulocytes 94%, nearly all with single-lobed nuclei. She developed a right tonsillar abscess and later an abscess in the right buttock, at the site of the pentnucleotide injection. The white-cell count rose, and by the 11th, when the abscess had become fluctuant, had reached 75,000. On the 14th the abscess was opened; the pus gave a pure growth of *Staphylococcus aureus*. By the 17th the temperature had fallen from 101° F. to 99° F., and the white-cell count from 63,000 to 15,000. Recovery was uneventful except for a *Bacillus coli* infection of the urine, which was successfully treated with mandelic acid. A blood-count on July 10 showed: Hb. 90%; white cells 8700 (polymorphs 44%, lymphocytes 53%, large mononuclears 3%).

DISCUSSION

The total dosage of sulphapyridine given was 43 g. in 18 days, well below the 50 g. which Sutherland (1939) considered dangerous. Granulocytopenia may be produced in some cases by massive dosage of the drug, whereas in others in which the dosage has been small (Tzank 1939, Spain 1940), individual sensitivity appears to be responsible. There remains a group, less easily explained, in which the dosage has been moderate. Of the 13 reported cases, 6 developed granulocytopenia during their second course of the drug; of these 1 had massive dosage (Barnett 1939) and 1, Tzank's case, was certainly sensitive to many different agents. Sensitisation may perhaps be produced in a first course of the drug and only revealed in a second. Hudson (1935) found that in cases treated with gold, half of those which developed purpura did so early in their second course of injections.

The presence of a drug rash cannot be taken as being of serious import. It occurred in 2 of the reported cases (Briggs 1939), both of which recovered. Many rashes also appear in patients with no granulocytopenia. The maximum fall of polymorphs in this case was not reached until 7 days after sulphapyridine had been discontinued. In Briggs's first case (1939) 12 days elapsed before the granulocytopenia reached its maxium, and other recorded cases make it clear that, as already emphasised by Montuschi (1940), any suspicious case should have frequent white-cell counts for a considerable time after the drug has been stopped. The recovery of this patient after 4 days of agranulocytosis is remarkable. Injections of sodium nucleinate were begun before agranulocytosis occurred, and were followed by large doses of pentnucleotide, but no leucocyte response was obtained until the eighth day. Briggs found the same thing in his first case; his patient, however, never had complete absence of granulocytes. A fall of lymphocytes accompanying the granulocytopenia is common; 7 out of the 13 recorded cases had lymphocyte counts of under 2000. This finding does appear to make the prognosis slightly worse since 4 of these 7 were fatal, while only 5 out of the total of 13 cases died.

REFERENCES

Barnett, H. L., Hartman, A. F., Perley, A. M. and Ruboff, M. B. (1939) *J. Amer. med. Ass.* **112**, 518.
Briggs, G. O. A. (1939) *Lancet*, **2**, 739.
Hudson, E. H. (1935) *Ibid*, **2**, 74.
Montuschi, E. (1940) *Brit. med. J.* **1**, 1055.
Spain, A. W. (1940) *Ibid*, **1**, 930.
Sutherland, M. E. (1939) *Lancet*, **1**, 1208.
Tzank, A., Arnous, J. and Paillas, J. P. (1939) *Bull. Soc. méd. Hôp. Paris*, **55**, 576.

The next term at St. Thomas's Hospital Medical school will begin on Jan. 2. Premedical and preclinical courses will be held at the new school centre at Godalming and a full clinical curriculum has been arranged in sector 8. The dean's office remains in London and further information may be obtained there.

Medical Societies

ROYAL SOCIETY OF MEDICINE

SECTION OF SURGERY

AT a meeting of this section on Dec. 4, with Mr. J. B. HUNTER, the president, in the chair, a discussion on

Chest Injuries

was opened by Mr. C. PRICE THOMAS. He said that in war chest wounds were second in their mortality-rate only to abdominal wounds. The factors which make them so deadly chiefly depend on interference with the cardio-respiratory reserve, due to the presence of air or blood in the pleural cavity. Open pneumothorax, besides collapsing a lung will cause a pendulum-swing of air between the lungs. Mediastinal flutter will be set up and aspiration effects produced in the great veins, to reduce the diastolic filling of the heart. These factors, if not checked, will all lead to death from anoxæmia. They are more dangerous in the old than in the young. In combating shock it is important to replace as early as possible the circulating colloids and to cut short the period of peripheral anoxæmia, the factor which damages the capillary bed. Oxygen should be given as well. Patients who survive the first 48 hours may succumb later from sepsis of the pleura or lung or both. This results from retention of a foreign body, bad laceration or necrosis of the tissues, or other conditions favourable to the further growth of infective organisms. The pleural cavity in hæmothorax provides an ideal culture medium. The surgeon should aim at removing not only the nidus but also the culture medium, and at inducing expansion of the lung as soon as possible to obliterate the pleural space. By doing so not only the mortality-rate but also the period of convalescence is reduced, and perhaps the chronic invalidism of later years. An insufficiently treated hæmothorax may organise in a mass of fibrous tissue and prevent expansion of the lung; this is another cause of late morbidity. A just balance must therefore be held between the necessity for intervention, the immediate risk, and a longer view of the prospects of morbidity. An accurate history of the circumstances is of great value, and knowledge of the position of the patient when hit may give a guide to the direction of the missile. Radiological evidence is indispensable. Anteroposterior and lateral films are both necessary; one anteroposterior film should if possible be a penetrating one, to reduce the risk of missing a foreign body. Radiograms are essential too in the after-management of the case. Whenever possible operation should be performed within 6 hours of the infliction of the wound. The chief indications for operation during this period are open pneumothorax, overt and progressive hæmorrhage, hæmothorax with a retained foreign body, and suspicion, from the direction of the injury, the position of a foreign body, or other evidence, that the diaphragm, heart or pericardium have been injured. Cases which will not need intervention are those of a through-and-through wound without hæmothorax or hæmoptysis, or where the entry wound does not constitute a sucking wound. The most important prerequisites for successful operation are an anæsthetist skilled in the management of thoracic cases; good light not only overhead but also from an efficient portable lamp within the thorax; and an efficient rib-stretcher. For the operation the patient lies on his side with a sandbag in his axilla. Brock's chest-rest will fit any table and is a valuable aid. An essential of the operation is a complete surgical revision of entry and exit. A wound situated in a place where thoracotomy could normally be performed may be enlarged and the chest opened through it. The temptation to explore through an ill-placed incision should be resisted at all costs. A thoracotomy of six or seven inches is usually ample, but a wound should be extended without hesitation to give sufficient access. Immediately after the operation the patient is nursed lying down, but as soon as his general condition allows he is gradually raised to a reclining position. Oxygen is as necessary after as before an operation. Patients who have undergone primary operation outside a chest centre should be

transferred to one as soon as possible for better post-operative care.

Dr. J. L. LIVINGSTONE said that the ordinary clinical signs are difficult to obtain in these cases, and there is therefore all the more reason to search for the essential ones—sputum, coarse sounds, and changes in the position of the apex-beat and the trachea. Internal injury may be present without external wound, and the size of the entry wound is no guide. It is useful to visualise the course of the missile. Wounds of the lower chest may be associated with sudden onset of abdominal rigidity exactly simulating peritonitis. An essential instrument in diagnosis is an exploring-needle of good size—13 or 14 wire gauge, preferably with a two-way tap between the needle and the syringe. The diaphragm is commonly high. Offensive-smelling blood withdrawn from the pleura is certainly infected, and anaerobic culture is worth asking for. In the presence of infection the needle should be used cautiously. Radiological diagnosis has a number of pitfalls. A considerable quantity of fluid may be present, particularly at the left base behind the heart, and cause only slight opacity in the film. A collapsed lower lobe may be masked by the heart shadow; metallic foreign bodies may be quite invisible unless a penetrating film is taken; blood-clot may simulate bile shadows and suggest a ruptured diaphragm. Patients are furiously hungry, and, even if they have a temperature, require full and varied diet with extra vitamins. The usual hospital diet is deficient in vitamins B and C. Anæmia is common and iron should be given as a routine. A suspension of washed blood-cells in 5% glucose raises the hæmoglobin impressively. In shock large amounts of plasma are required quickly. In using sulphapyridine against pneumococcal infection a uniform scheme of dosage is important and the dose should be noted on the temperature chart. The drug should be withheld until the effect of adequate drainage has been seen. In more than one case of meningismus the drug has prevented meningitis. Skilled nursing is important, and bedsores should be watched for. Patients should be encouraged to make active movements of the spine and limbs and to get up as soon as possible. A drainage-tube should not keep the patient in bed if there is no toxæmia. Patients need encouragement and entertainment; occupational therapy has been found useful. Physiotherapy should include special breathing exercises to promote expansion of the lung and ensure proper diaphragmatic breathing. The masseuse should be specially trained in work with these cases and should be selected for her personality and power of making the patients persevere with their exercises. These should be started early, but in pneumothorax it is wise to wait a week. Other exercises should aim at preventing deformities of the chest and spine. Infrared rays are useful for chronic wounds and diathermy for intrathoracic sepsis. General ultraviolet light baths seem to have a tonic effect in some debilitated cases.

Mr. NORMAN BARRETT said that if the patient is seen within a few hours of the injury the wound, unless it is small and uncomplicated, should be excised. It is rarely justifiable to close a chest wound. After operating on a sucking wound which has been excised the surgeon must close it to avoid an open pneumothorax. If the excision has not been thorough the wound should not be sutured but covered with a large pad. Packs encourage sepsis and hinder drainage. The most difficult wound to excise is one in which the missile has penetrated the scapula and damaged muscles and ribs; it may be necessary to make a separate incision and to lift the scapula off the chest wall. Fractures of the thoracic cage are apt to introduce a special risk by impairing its mechanical stability. Crush injuries are more likely to break the ribs than other bones. Simple fractures of ribs are either direct or burst fractures; in the latter the force is transmitted round the rib to its weakest point and the cage bursts outwards. This is commoner in the upper part of the chest. Such fractures are seldom comminuted but are clinically important because they cause pain and sometimes hæmothorax. Fractures of the ribs may be complicated by traumatic asphyxia and acute dilatation of the stomach. If coughing is painful or ineffective, the vomit may be partially inhaled. The importance of a simple fracture lies in the possibility that the movements of breathing may be limited by pain or rendered ineffective by an unstable chest wall. Breathing may be controlled by strapping the chest over a wide area. The other indication for immobilising part of the chest is paradoxical movement. Compound fractures of ribs are usually due to penetrating foreign bodies. They have been neglected because surgeons appear to be frightened of creating or enlarging open wounds of the pleura. The outlook is more serious in bullet-wounds if the rib has been struck, for the bullet may have been set spinning on its short axis. The gravity of thoracic wounds involving the vertebral column depends on whether the spine has been injured. Simple fractures of the sternum cause pain, ecchymosis and sometimes a palpable deformity.

Dr. W. D. W. BROOKS mentioned the use of the Nuffield respirator in nursing multiple fractures of ribs. It obviates paradoxical movement and overcomes the dyspnœa from which these patients so often die. Two patients from Dunkirk with hæmothorax, one with a foreign body as well, became œdematous after a week and ten days respectively. The usual causes of œdema were excluded, but there was a reduction of the total quantity of proteins in the serum, chiefly of the albumins. The blood in the hæmothorax was much diluted with serum. Observations were made on every case in which large amounts of serum might have been lost through a drainage-tube, and in a certain number of them the level of the blood protein was altered. The level is probably maintained up to a critical point and then falls rapidly. The treatment is simple—an intravenous injection of serum. Preserved plasma is not so concentrated and contains Merthiolate, which in considerable quantities is dangerous to the kidneys.

Mr. J. E. H. ROBERTS spoke of contra-indications to operation. One of the most important is, he said, blast injury of the lung. Of two patients whose abdomens had been opened for intense abdominal symptoms, neither presented any lesion and this was the cause. If a batch of bomb casualties contains one blast case it probably also contains others, even though signs and symptoms are lacking. These sometimes appear after 48 hours, for the lesion is progressive. Bleeding from the capillaries into the lungs may continue for several days before death, the length of time depending on the amount of hæmorrhage. Some cases show minute punctiform hæmorrhages in the skin of the abdomen, chest and front of the arms; others suffer from slight dyspnœa, cyanosis and increase of pulse-rate, or from rigidity and tenderness of the abdominal wall. At autopsy the intercostal muscles may be infiltrated with blood. Blast effects should always be suspected in every batch of bomb casualties, and no operation should be performed under a general anæsthetic until the surgeon has ascertained that the effects on the lung are not progressive. Blast cases require oxygen early, and some are better with morphia. Cerebral irritation may be so intense that they cannot be given oxygen. The other contra-indication to operation is poisoning by carbon monoxide.

Dr. M. D. NOSWORTHY said he had seen no ill effects from Pentothal sodium, though it may be contra-indicated because of its respiratory depressant action. The presence of copious tracheo-bronchial secretion has seldom been a prominent feature. He mostly uses the pharyngeal airway; when secretion is present, an endo-tracheal anæsthetic, with provision for adequate suction, is essential. Aspiration of the tracheo-bronchial tree may be life-saving. He described the uses and value of controlling the breathing by squeezing the mixing-bag.

Mr. P. N. CUTNER pointed out the danger of missing a tuberculous lesion through its shadow being masked by a large foreign body.

Mr. O. S. TUBBS said that patients wounded in the chest travel extraordinarily well. Crush injuries, and staving-in of ribs inside the thoracic cage, are becoming more common; they are being treated simply by strapping.

Mr. R. C. BROCK said he was impressed with controlled respiration and was sure it repaid careful attention, especially in saving patients who were moribund from loss of blood. The surgical treatment of chest wounds is, he declared, more a problem of administration and organisation than of surgery—getting a patient to the operating-table in time for intervention to be of any use. The two points which cause anxiety are the treatment of

a chest-wall wound, and what should be done inside the chest. The problem of making or enlarging a hole in the pleura has been shirked. The surgeon should have no fear about doing this; moreover, if he leaves a fractured rib, contaminated with a retained foreign body and leading down to a hæmothorax, he is not fulfilling his surgical duties. Once the chest has been opened by thoracotomy the pleura must be properly cleared out. The lung is very tolerant of direct interference.

Reviews of Books

Textbook of Dietetics

By L. S. P. DAVIDSON, M.D. Edin., F.R.C.P., F.R.S.E., professor of medicine and clinical medicine in the University of Edinburgh; and I. A. ANDERSON, M.B. Aberd., clinical tutor and assistant in the metabolic wards, Royal Infirmary, Aberdeen. London: Hamish Hamilton. Pp. 324. 10*s*. 6*d*.

THE art of dietetics has a history stretching far into the past; the science of dietetics has only recently achieved recognition; and the union of the art and the science has only just become possible. As a consequence, up to now books on dietetics have tended to be of one of two types. Those based on the art of dietetics have, save in relation to one or two special diseases, been largely empirical in teaching and glorified cookery-books in practice; while those based on the science have typically been highly technical accounts of experimental investigation unintelligible to all save the expert. The need for a book by writers with first-hand knowledge of both the art and the science has long been felt and Professor Davidson and Dr. Anderson have now met this need. Both are in a position to criticise and assess the different aspects of their subject and they have not hesitated to do so. Dietetic fallacies long rooted in clinical tradition are ruthlessly exposed and speculations on, as distinct from the facts of, modern investigations are judiciously discouraged. The result is a book whose practical and sound teaching will command the confidence not only of students of dietetics but of practitioners in medicine.

The book is divided into five parts. In the first are discussed the different diets available to the different economic classes of our present society and the effects of such diets on development and health. This aspect of the subject is confusing only in so far as it has been made so by political propaganda. When the facts are presented as objectively as they are here, it is neither difficult to assess the actual position nor to envisage the necessary solutions. The second part deals concisely but adequately with the physiology of nutrition. The exposition is made with such lucidity that anyone, even if his student days are long past, can gain from it the principles on which rational dietetics are based. In the third part the dietary requirements in the periods of physiological stress are considered and the genesis of ill health at such times and the appropriate measures for its prevention and cure are discussed. The fourth part is concerned with the dietetic treatment of disease, and in this the writers have set and carried through a high therapeutic standard. "No dietetic restriction should be imposed that cannot be justified on physiological, biochemical or clinical grounds. To withhold much desired foods on no better sanction than fashion or tradition not only discredits the practice of dietetics but may inflict misery and harm on the suffering patient." This standard has necessitated the clearing away of much empirical lumber from clinical dietetics and its replacement by tested new knowledge, but the result is that in these pages the physician will discover a system of dietetic treatment which is capable of rational application. The fifth part gives tables of recipes and diet sheets and it is for this part that the busy practitioner will be most grateful. Ingenious schemes for simplifying the prescription of different diets often add to the patient's confusion; when a diet is prescribed what the patient needs is a menu, and scores of appropriate menus are given in this book.

It is a pity that the authors have not dealt with the subject of sensitivity to food. Their robust common sense might have swept away many myths from this subject to the advantage of those who have to deal with practical dietetics.

Statistical Calculation for Beginners

By E. G. CHAMBERS, M.A., assistant director of research in industrial psychology, University of Cambridge. London: Cambridge University Press. Pp. 110. 7*s*. 6*d*.

Mr. Chambers has set out to explain as simply as possible how to perform the calculations involved in the statistical methods most commonly used—the calculation of averages, measures of dispersion, correlation coefficients, and tests of significance of various kinds for small as well as large samples. From the last he omits rather unexpectedly the standard error of a proportion and of the difference between two proportions. His description of the steps required is mainly very clear, though sometimes rather condensed, and is well illustrated by numerical examples, while those who like mathematical symbols have not been neglected. He naturally writes with an eye on psychology and draws his examples from that field, but his little book should prove equally useful to workers in other sciences.

A General Zoology of the Invertebrates

By G. S. CARTER, fellow of Corpus Christi College and lecturer in zoology in the University of Cambridge. London: Sidgwick and Jackson. Pp. 501. 25*s*.

MUCH of our knowledge of the principles of animal biology has been gained from research on invertebrates. They present such a variety of structural and physiological adaptations that there is scarcely a group which is not especially suitable for the investigation of some fundamental problem which for technical reasons is less easily attacked in a vertebrate. The structure of protoplasm, genetical cytology, amœboid and ciliary movement, nervous transmission, fertilisation, growth and regeneration are a few of the many subjects for which certain invertebrates afford particularly suitable experimental material. Unfortunately the many general books on invertebrate zoology are almost exclusively morphological. Dr. Carter's work is therefore especially welcome for students and particularly those who intend to do experimental research in any branch of animal biology. The subject matter should be included in any second-year honours course in zoology. The book has been admirably planned and is well illustrated, but the student may find the style rather ponderous.

The Microscope

By R. M. ALLEN. London: Chapman and Hall. Pp. 286. 15*s*.

ALL laboratory workers agree about the need for understanding the physics of the microscope but apart from the motor-car it is perhaps the least well understood of popular scientific instruments. The trouble is that the modern microscope works so easily and so well that we are content, in our ignorance, with something less than half its possible efficiency. Mr. Allen's chapters on the optical principles of the microscope and on critical illumination are clear and to the point, and well within the reach of lay understanding. Dark-ground illumination is a technique to which too little attention has been given in this country and the description of its theory and practice should encourage the reader to explore its many uses. On the historical side Mr. Allen has many interesting things to say and no-one who wishes to know the history of biology can afford to ignore the development of the microscope. The book is well supplied with clear-cut diagrams but it is over-burdened with photographs of the various makes of instruments which are readily available in makers' catalogues. The later sections deal with the preparation of material for examination—a vast subject on which the author has tried to say too much in too little space. Dirty microslides are a perpetual bane to the laboratory worker but the author's recipe for removing grease—chromic acid, or alcohol and hydrochloric acid, followed by wiping with a clean cloth—is, in its last instruction, almost a guarantee that new grease will replace the old. The book has a bibliography and a glossary and deserves a place on the laboratory bench rather than on the bookshelf.

CLIMACTERIC SYNDROME RELIEVED

"High Doses of Oestrin are usually unnecessary, at any rate for the commoner menopausal symptoms — such as vasomotor disturbances—and consequently oestrin injections are, fortunately, seldom required. It has been my practice to begin with doses of about 500 I.U. daily by mouth. If this does not control the symptoms the dose is raised to 1,000 . . . this is usually completely effective. There are, of course, certain more severe sequelæ of the menopause, which demand much higher doses . . . Pruritis, Kraurosis, Leukoplakia vulvæ, fall into this class and, provided sufficiently high doses are given, the results are little short of miraculous."

PROC. ROY. SOC. MED. Vol. XXIX. Page 1094

MENFORMON TABLETS

ŒSTRONE

SAMPLES AND INFORMATION FROM:

MEDICAL SERVICE DEPARTMENT

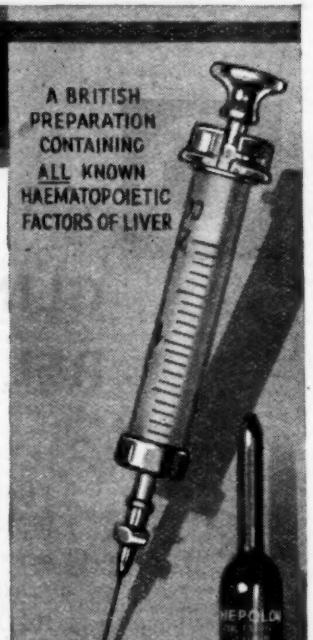
ORGANON LABORATORIES LIMITED

77 NEWMAN STREET, LONDON, W.1

Telephone: Museum 2857 (3 lines). Telegrams: Menformon, Rath, London

E. Africa: Howse & McGeorge, Ltd. Nairobi, etc.
S. Africa: Heynes Mathew Ltd., P.O. Box 242, Cape Town
Australia: F. H. Faulding & Co. Ltd.
New Zealand: Dominion Dental Supplies Ltd.
Malta: John Meli, Valetta
India: Morison, Son & Jones (India) Ltd. P.O. Box 258, Bombay
Ceylon: Morison, Son & Jones (Ceylon) Ltd., P.O. Box 430, Colombo
Straits Settlements Grafton Laboratories Ltd., Singapore

HEPOLON



TOTAL LIVER EXTRACT FOR PARENTERAL INJECTION

is produced by improved processes which conserve all the known hæmatopoietic principles of the whole liver; it gives no reactions for histamine or undesirable protein. HEPOLON approximates to the extract described by Gansslen; later extracts have been described as of narrower therapeutic value.

HEPOLON not only passes the highest clinical tests for potency against pernicious anæmia but contains Whipple's factor, Wills's factor, vitamin B_2, nicotinic acid, and the hæmatinic minerals of liver.

Prices in Great Britain and Northern Ireland (subject to alteration without notice):

Ampoules of 2 c.cm.: box of 6, 6/-, box of 12, 11/6, and box of 24, 22/-

Rubber-capped vial of 10 c.cm., 5/-, and of 30 c.cm., 12/6

ALLEN & HANBURYS LTD · LONDON · E·2

Telephone: Bishopsgate 3201 (12 lines) *Telegraphic Address*: Greenburys Beth London

NONAD TULLE

TRADE MARK

NON ADHERENT GAUZE NET

VITAMINIZED AND STERILE

NONAD TULLE is a gauze with a mesh of 2 millimetres and impregnated with 98 parts of soft paraffin, 1 of balsam of Peru, and 1 of halibut-liver oil, that rich source of vitamins A and D.

Dressings made with NONAD TULLE as their foundation are easily removed, without pain or bleeding. Through the wide mesh, secretions are easily absorbed by the outer dressings: accordingly dangerous products do not accumulate in the lesion, and it need not be dressed so often as usual.

NONAD TULLE may be used on septic wounds, burns, gangrene, sloughs, varicose ulcers, indolent wounds, operation wounds, pruritic or infective eruptions, and solar or actinic dermatitis.

In tins of 10 pieces, 4 in. × 4 in.

Price 3/6

NONAD TULLE PROMOTES QUICK HEALING

ALLEN & HANBURYS LTD · LONDON · E·2

TELEPHONE: BISHOPSGATE 3201 (12 LINES). TELEGRAMS: GREENBURYS BETH LONDON

THE LANCET

LONDON: SATURDAY, DECEMBER 21, 1940

ANÆSTHESIA IN THE SHOCKED PATIENT

A MONTH ago two young surgeons who have studied continental experience objected in our correspondence columns[1] to a categoric statement in M.R.C. War Memorandum No. 1 that to induce anæsthesia in a shocked patient gas and oxygen, combined with ether if necessary, is the mixture of choice. This recommendation was qualified by the proviso that a skilled anæsthetist with the necessary apparatus must be available and cyanosis be avoided, otherwise ether alone should be used. Chloroform and spinal anæsthesia were ruled out and emphasis laid on the special care to be taken in giving any anæsthetic to a shocked patient. Our correspondents insisted on the primary importance of using local and regional anæsthesia in these cases and related the experience of a team of surgeons during the Finnish campaign who were able to compare the condition of wounded men on two operating tables, one being used for general the other for local anæsthesia, and who found that when local anæsthesia was used the patient came out of his shocked condition while on the table. They conclude that methods of local anæsthesia should be further explored in the prevention and treatment of wound shock. It will probably be conceded that any form of noxious inhalation is to be avoided in patients who show signs of shock. Even if we do not go as far as PICKRELL in regarding every circulating narcotic as an assault on the integrity of the body,[2] yet we must still regard a general anæsthetic as a noxa, however mild in degree, which may be faced with impunity by the healthy person undergoing operation at a chosen time and place, but is never negligible when the circulation is depressed by tissue damage or loss of blood. Overruling every other consideration is the need to relieve pain, although it must be borne in mind that no decisive evidence was presented to the M.R.C. committee that painful nerve impulses play any large part in the causation of traumatic shock.

Stated as an abstract proposition there is no question that local anæsthesia abolishes shock and that its after-effects are less depressing than those of a general anæsthetic. Visitors to surgical clinics such as those of Zürich or Berne a decade ago when they were directed by masters of technique like CLAIRMONT and DE QUERVAIN were impressed by the spectacular success of block and infiltration anæsthesia, although they were uncomfortably aware that the success was not uniform. Unfortunately too it lowers the blood-pressure. This however does not apply to the arm, where brachial-plexus anæsthesia is well-nigh perfect for a shocked patient. The head too, and the face, can be operated upon under local anæsthesia whereas conduction anæsthesia in the lower limb is uncertain and difficult to carry out. But in a practical world we cannot overlook the fact that local anæsthesia has a technique which is not acquired overnight and good results will only be obtained by those who possess the skill to use it effectively. Little opportunity for gaining this experience is offered in schools where specialist anæsthetists have brought their art to a smooth consummation so comforting to the busy surgeon, and DODD has stated clearly[3] why local anæsthesia cannot be popular in teaching hospitals. Moreover regional anæsthesia presupposes apparatus which requires a team of trained attendants and at the present time all the paraphernalia of syringes and needles are hard to come by. The principles may be sound enough but the difficulties in putting them into practice may be insuperable. The final objection to the use of local anæsthesia for air-raid casualties remains to be stated: in the majority of cases the injuries are multiple and it is not practicable to anæsthetise several areas of the body at once.

Three words only need be said about the choice of a general anæsthetic. There is none. It matters little what anæsthetic, barring chloroform, is chosen so long as the correct quantity is given and the administrator is familiar with his task. The safeguard of nitrous oxide is that, given with sufficient oxygen, it is simply impossible to procure deep anæsthesia; and no-one in his senses would add anoxia to the other risks of shock. TRUETA, who is now working at the Wingfield Hospital, Oxford, regards ether as the safest anæsthetic in dealing with air-raid casualties; it is easily portable and in emergency one anæsthetist can supervise two or three tables near him.

WANTED: A LEAD

Sir WILLIAM BRAGG lately made a plea for greater coöperation between science and the state.[4] "We do not claim," he said, "that men of science shall be entrusted with authority because they are men of science; we do claim that authority shall be exercised in the light of a knowledge which grows continuously, and with continual effect on politics, on industry, and on thought itself. If at present the only way to bring this knowledge into use is to treat men of science as consultants, let us take that way. But we shall be taking the better way if in all ranks of the State . . . we can arouse a general appreciation of the position. . . ." Many have deplored that advances in medical knowledge take so long to filter through to the official health services, and that central health departments do not always give that energetic lead in the shaping of health policies that ought to be their function and their privilege. This is not necessarily a reflection on the medical officers of these departments, who have numbered many famous and active men. Rather may it be a commentary on the conditions under which they have to work. The heads of our health services are politicians, and the officers directly responsible to them are administrative civil servants who regard their professional advisers as consultants whose advice may be taken or left as suits prevailing political fashion. The politician is not always a man of vision and he may regard his political future as being inconsistent with a line which his department wishes him to take. His senior administrative colleagues, who influence so largely departmental policy, may not all be men of

1. Ruscoe Clarke and Lipmann Kessel, *Lancet*, Nov. 23, 1940, p. 664.
2. Pickrell, K. L. *Anesth. & Analges.* 1940, **19**, 272.
3. Dodd, H. *Brit. med. J.* 1940, **2**, 348.
4. *Nature, Lond.* 1940, **146**, 731.

great vision either, or they may be torn between a desire to fall in with the views of their political chief on the one hand and their professional officers on the other.

It is politically unsound to be ahead of public opinion, and the forces of inertia are heavily loaded against progress that is deemed to be before its time. It is perhaps for this reason that our central health departments are unwilling to give the public what is good for it as distinct from what they think it wants. The most certain way of securing health legislation is by well-directed pressure from outside. Central action then becomes a reaction to external pressure and it is sometimes amusing to observe the zeal with which politicians hasten to assume the paternity of babies previously unwanted. For some years the central health departments have been damning with faint praise immunisation against diphtheria; only recently, and in the face of considerable external agitation, have they begun to urge effective action. There is a considerable body of opinion hostile to immunisation, as to many other things, but that should not have prevented the departments from launching a determined and unceasing drive in favour of immunisation as soon as they were satisfied that it was a valuable health measure.

The times are propitious for a new conception of the place of the central departments as a constructive force in shaping health policy, and most doctors will not be slow to follow a strong lead. The nation should be made to realise that medicine has a real contribution to make towards the solution of many war and post-war problems. "Science," as Sir WILLIAM BRAGG said, "is not a devouring monster, but a means of service. . . . There is a prime danger if those who are in the position to use it rightly shut their eyes to its presence and its power. . . ."

TRAUMA AND CANCER

UNTIL the present century the causation of cancer was an entire mystery. Today we can distinguish several causes—synthetic chemical compounds, natural hormones, viruses, and different kinds of radiation including ultraviolet light and α, β and γ rays—but dark corners remain where ignorance still abides, often barricaded behind the litter of the past. At least we could now clear the lumber out of the way. Mr. CECIL JOLL[1] complains that "our textbooks of surgery, medicine and pathology, to say nothing of many monographs on cancer, almost without exception expound the view that a single trauma . . . is of itself capable of producing a malignant growth at the site of the trauma." The candidate for a medical diploma or degree is, he says, expected to apply the term "traumatic cancer" to certain tumours of the breast and other organs. Our courts of law from time to time endorse this teaching by awarding damages when a cancer has developed at the site of an injury. It is true that to claim compensation on account of traumatic cancer is somewhat speculative, and to win his case the client will need capable expert witnesses on his behalf, but it is surprising that he should ever succeed. Now and then cases which seem to be examples of traumatic cancer are published. We read of the gentleman who burnt his eyelid with cigar-ash; the little burn never healed and ultimately a rodent ulcer appeared at the injured spot. A reasonable interpretation of the case is to assume the existence beforehand of a small basal-cell carcinoma to which the hot cigar-ash directed attention. Again there is the tar worker who received a splash of hot tar on the back of his hand, the accident being followed after a short interval by the growth of an epithelioma at the site of injury. Common sense is not outraged if the tumour in this instance is attributed to tar rather than to the burn. A woman who had remained well for five years after mastectomy for cancer dropped a weight on her foot, fracturing a metatarsal which became almost at once the seat of a malignant growth. Whatever her clinical notes and pathological reports may say, it is almost certain that a metastatic new growth was already present when the bone was broken. Apart from explanations of this kind, in a world of many millions coincidences will sometimes happen and cancer will appear in tissues which have been recently hurt, though the cancer has no causal relationship with the trauma. In the laboratory no-one has succeeded yet in causing cancer by simple traumatism.

A doctor's attention cannot be confined entirely to the disease from which his patient is suffering—his duty includes the easement of the sick man's mind, and when a sufferer from cancer asks "what caused this trouble?" the reply may well be "probably some small injury which you perhaps have forgotten." Such an answer, confidently given, at least dispels some of the fear of the unknown. Moreover, an injury is a clean affair, free from any moral stigma and unassociated with implications of family taint or with unpleasant objects, past habits and experiences which are painful to remember. The great disadvantage of such a verbal placebo is that the doctor, from repetition, may come to believe it himself.

1. Joll, C. A. *West Lond. Med. J.* October, 1940, p. 58.

QUICK CURES FOR A COLD

THE common cold is still easier to catch than to cure, and the public is right in reproaching the medical profession for not turning the full powers of controlled experiment on the search for a way of preventing it or cutting it short; not that the public can claim to have given a fair trial to the measures whose efficacy has been proved. What the patient wants is a quick recovery with no complications, but though every doctor and nearly every layman has his pet treatment there is still truth in the cynical saw that it takes a week to cure a cold but it cures itself in seven days. Most doctors would agree that the best treatment for an incipient cold is complete rest in bed for a day or two days, thereby saving the patient a week of misery, and, more important, preventing dissemination of the infection to others. Bed, blankets and brandy is an ancient cure, and if the brandy is not now available a sweating powder like Dover's or aspirin, with a hot drink, may take its place. A saline purge will help. The room must be warm but well ventilated, and both hands and feet should be kept warm with bed-socks or mits, for LEONARD HILL demonstrated years ago that cold feet and a stuffy atmosphere produce nasal turgescence. If the patient cannot or will not go to bed he should still try to keep his hands and feet warm—no easy task, for a cold seems to induce vasomotor instability in the skin. He has a choice of ambulatory treatments. Of the

more highbrow, short-wave therapy to the nose has lately been advocated as a quick cure. Dr. J. P. P. STOCK has been using this form of treatment among the employees of a large factory, and in controlled tests has obtained encouraging results which are not yet extensive enough for publication.

Most of us have to rely on drugs or local applications. Quinine and the opium alkaloids have long enjoyed a reputation for cutting short attacks. In a careful investigation at the University of Minnesota, DIEHL [1] found that the most successful preparation was a mixture of codeine and papaverine, gr. ¼ of each in the morning and afternoon and gr. ¾ of each at bedtime. Of 216 students with incipient colds 75% reported improvement or recovery in 24–48 hours with this mixture, compared with 35% similarly improved by lactose pills; aspirin and large doses of sodium bicarbonate gave no better results than the lactose. So far the sulphonamide drugs have failed us in the treatment of uncomplicated colds, and their toxic effects, especially in ambulant patients, must be borne in mind. Vitamins have a wide popularity as prophylactics, though perhaps without statistical support, and massive doses have also been used in treatment—for example, a capsule of Dekadexolin (a concentrate of vitamins A and D) every hour during the first day of a cold, or an injection of 1 c.cm., repeated next day if required. Local applications mostly consist of an emollient base with the addition of menthol and essential oils, with or without ephedrine. However tempting it may be, acutely congested mucous membranes should not be repeatedly blanched by vasoconstrictors, for these may impede ciliary action and interfere with nature's bactericidal efforts. Later they may be useful to facilitate drainage from an infected sinus. Glegg's mixture, of which POULTON [2] was an advocate, can be used in both the early and late phases of a cold. This is the naristilla paraffini of the L.C.C. pharmacopœia and consists of white soft paraffin 1 part and liquid paraffin 3 parts. It must be dropped into the nostrils with a pipette while the patient lies on his back. Like many others this cure has its enthusiasts who claim that it is infallible, but at least it can be relied on to relieve the cold-headache which is often wrongly labelled sinusitis.

1. Diehl, H. S. *J. Amer. med. Ass.* 1933, **101**, 2042.

2. Poulton, E. P. *Lancet*, 1932, **1**, 933.

Annotations

THE A.M.A. AT BAY

Dr. Morris Fishbein, editor of the *Journal of the American Medical Association*, has been summoned for trial at the U.S. district court of Columbia on a charge of conspiring to violate section 3 of the Sherman Anti-Trust Act. Other defendants in the action are the secretary and general manager of the association, the secretary of the council of medical education and the director of its bureau of medical economics. They will all have to remain in Washington for many weeks and the keenest sympathy will be felt with them and the association which they serve for their enforced inactivity at the present time; for, as the J.A.M.A. points out in its announcement,[1] the association when requested to assist in the present national emergency voted unanimously to give whole-hearted coöperation and support. Its officers have since been engaged intensively in that service and in working to provide all the various arms of the government with the physicians they need. Plans have been laid to carry on the work of the association in order that the medical world and the public may not suffer.

It may be recalled that the indictment by the assistant attorney general, published more than two years ago, spoke of the American Medical Association, the only important society representing the medical profession in the United States, as having expressed a policy of opposition to group medical practice on a risk-sharing prepayment basis, without opening the columns of its journal to contrary views. The defendants, he said, had conspired together for the purpose of restraining the members of Group Health Association, Inc. from obtaining, by coöperative efforts, adequate medical care for themselves and their dependants from doctors engaged in group medical practice on a risk-sharing basis; and for the purpose of restraining certain Washington hospitals in the business of operating such hospitals.

Group Health Association, inaugurated in November, 1937, is composed of government employees working in Washington, for whom the Home Owners Loan Corporation arranged a system of health insurance. The District of Columbia Medical Society regarded aspects of the group association as illegal, and announced that it was working out a system of insurance of its own. Next the American Medical Association intervened, and brought pressure to bear on local hospitals to refuse admission to patients belonging to the group association. The controversy attained nation-wide importance, and if the essential issues come clearly before the grand jury in Washington they will be faced with a decision of vital interest to medicine not only in the U.S.A. but in the whole civilised world. The section of the Anti-Trust Act which the A.M.A. is said to have infringed prohibits "combinations which prevent others from competing for services as well as goods." There was at the outset a doubt whether it would be possible to obtain a conviction under this indictment because it would be necessary to prove that medicine is a trade rather than a profession and is involved in inter-state commerce.

The items in the platform of the American Medical Association which embody its present policy for the provision of medical services include:

The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

In the extension of medical services to all the people, the utmost utilisation of qualified medical and hospital facilities already established.

The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

Expansion of public-health and medical services consistent with the American system of democracy.

It would not be proper at this moment to say more.

1. *J. Amer. med. Ass.* 1940, **115**, 1366.

EVACUATION PROBLEMS GETTING SOLVED

MANY of the school reports that are coming in throw light on the evacuation problem and demonstrate the capacity of the medical service to cope with all matters which lie within its province. Of the children evacuated from the London area to Northampton county Dr. C. M. Smith tells us that 10 per cent. were unclean. In the three years 1936–38 the uncleanliness percentage of the native children was 5·2, 6·1 and 5·7 respectively. The difference expressed in rates does not appear to be great but in practice it is formidable. Dr. Smith remarks that the fault is mainly carelessness, indifference or negligence, and in some few cases sheer incapacity, on the part of the parents. The school service soon learned that these four "causes" not only required different treatment but varied according to the level of cleanliness locally. Incapable parents may have been prevented by hard luck, severe poverty and the like from giving their children the attention they require, or their lack of mental ability may make them incapable in any circumstances. The incapable who have shown themselves hopeless should be obliged, Dr. Smith feels, to hand over their children to the state, for nothing short of that will give them an opportunity of reasonable upbringing. This is arguable, but it serves to show that the only obstruction which the school medical service cannot overcome is lack of mental capacity on the part of parents. It can see its way through all other difficulties if backed by a strong public conscience. Bedwetting came as a complete surprise to receptionists, but Dr. Smith soon found his way through this difficulty, as he did through those connected with contagious skin conditions. Repeated application to governmental departments and to evacuation authorities for extra help were in general fruitless, but metropolitan medical officers were helpful (he mentions Willesden and Walthamstow). He appreciated the arrangements made by the Central Midwives Board for drafting staff to the districts where it was required, but as the C.M.B. has nothing to do with the school service the appreciation is a covert rebuke to the Board of Education and Ministry of Health for not having done likewise. Dr. Smith insists that it would be entirely wrong if the impression were gained that the immigrant children had given rise to endless trouble and anxiety. They gave work, hard work, and in some cases work which was not expected, but (says he) a well-organised school medical service is not easily put out. Epidemiologists will learn with interest that the children from London suffered less than the native children from influenza, rubella and measles, which were highly prevalent in Northants during the spring of 1940.

PANTOTHENIC ACID AND ADRENAL LESIONS

NEW discoveries of the essential constituents of animal diets are made yearly, and it should soon be possible to feed animals completely on synthetic materials. Where yeast or wheat germ or their fractions used to be given as sources of the vitamin-B complex, it is now almost possible to substitute the individual substances of the complex. The synthesis of pantothenic acid, announced earlier in the year, is another step in this direction. The substance has been shown to be essential for the growth of rats, and to prevent dermatitis in chicks. As further essential substances are identified it becomes easier to study the symptoms produced by a deficiency of any one of them. Daft and his co-workers[1] have fed rats a diet consisting of casein, cod-liver oil, Wesson oil (as an additional source of fats) a salt mixture, and sucrose, with supplements of choline, thiamin chloride (aneurin B_1), riboflavin (B_2), pyridoxin hydrochloride (adermin B_6), and nicotinic acid (B_7). The absence of vitamin C is not relevant, since rats do not use this vitamin. More than half these rats developed epistaxis, ocular exudate, spectacled eyes, depilation and degeneration in the adrenal glands. Ashburn reports[2] that their adrenals showed congestion, hæmorrhage, atrophy, necrosis, fibrosis, hæmosiderin deposition and cortical fat depletion. The spleen and pancreas were healthy, but testicular function was abnormal and the upper epiphyseal cartilage showed hypoplasia.

The diet was deficient in only one fully identified essential factor—pantothenic acid. After 10 weeks on the diet the rats were divided into different groups. One group continued on the old menu; the others received, in addition, doses of pantothenic acid, ranging from 100–200 μg., for periods of 6–14 days. In all the treated rats, the symptoms disappeared entirely or decreased in severity, while the symptoms of those receiving no supplement were exacerbated. In the rats in all groups the adrenals showed congestion, fibrosis, scarring and hæmosiderin deposition; but in 10 out of 16 rats on the deficient diet the adrenals also showed hæmorrhage, atrophy, and necrosis; only 1 of the 28 rats in the other groups showed active lesions (and Ashburn suggests that this one was mislabelled). The fat content of the adrenals of the different groups varied strikingly: 14 of the 16 untreated animals showed considerable depletion in the fascicular zone; in the 28 treated animals this zone was normal in 6 and slightly depleted in 18 others; the remaining 4 showed moderate depletion in patchy areas. The functional state of the gland is thought to be related to its fat content, so that pantothenic acid may be concerned with the ability of the gland to produce cortical hormone. In this experiment the testes failed to recover normal appearance or function as a result of pantothenic acid, but in another experiment, where the supplement was given for 5 weeks, the testes at the end of treatment showed no abnormal cells and spermatozoa were numerous. Evidently function does improve but the change is gradual and takes some time to become demonstrable. In the treated animals, the tibial epiphyseal cartilages become hyperactive, and skeletal growth, which is slower than usual in the untreated animals, is accelerated. Daft and his co-workers attributed the pathological findings in rats on a diet deficient in pantothenic acid to adrenal cortical insufficiency.

MONKEY TRICKS IN THE NURSERY

NEARLY 50 years ago attention was first drawn to the curious ability of the newborn infant to suspend the weight of his body in mid-air by the strength of his own grip. Why this should happen is still not clear and speculation does not offer much of scientific value. But a study of the performance in the developing infant and the relationship of changes to the maturation of the central nervous system present some scope for the investigator. Myrtle B. McGraw,[3] working in the department of pediatrics of Columbia University and at the Babies' Hospital, New York, devised a standard method of observing the length of time that infants would remain suspended from a rod by both hands or by right hand or left hand alone. Measurements of this "suspension time" were obtained at intervals on a group of 91 children over several years. The total number of measurements for two-hand suspension was 3121, for right-hand suspension 2017 and for left-hand suspension 1827. It was found that starting from a relatively low level immediately after birth both single-hand and double-hand suspension reach a maximum at about the end of the first month. About the end of the third or fourth month single-hand suspension becomes almost extinct and suspension by both hands fluctuates about a low level. Then, somewhat surprisingly, this suspension

1. *Publ. Hlth Rep., Wash.* July 26, 1940, p. 1333.

2. *Ibid*, p. 1337.
3. *Amer. J. Dis. Child.* October, 1940, p. 799.

phenomenon reappears and from the end of the first year in the case of two-handed suspension and somewhat later—even as late as the third year—in the case of single-hand suspension the measured time increases. There are, however, qualitative differences in the performance of older children which suggest that the later achievements are deliberate or voluntary. There is a difference in posture also in these older children. The infant hanging by both hands lets the head drop back towards the interscapular region and flexes the lower extremities on the abdomen. The older child tends to hold the head erect and extend the legs, until fatigue causes a reversion to the infantile position. The method of grasp also varies; the young infant localises his grip in the distal phalanges, leaving the thumb passively adducted on the palm; as the child grows older there is an increasing tendency for him to hold the rod in the palm of the hand with the thumb actively engaged in the grip. It is suggested that the suspension phenomenon in the newborn infant is controlled at a subcortical or lower level in the central nervous system. Indeed McGraw has observed the phenomenon in 3 anencephalic infants. The reduction in suspension-time after the first month suggests that the inhibiting influence of the cortex is beginning to assert itself and during the next 3 months cortical inhibition becomes completely dominant, so that suspension behaviour is either extinct or nearly so. The later re-establishment of the phenomenon suggests a large degree of voluntary coöperation. This is regarded as evidence of the maturation of those cortical cells which activate or control neuromuscular movements and fits in with other studies of neuromuscular development. Although McGraw's studies are solely concerned with the suspension phenomenon in normal infants, failure or delay in the appearance of the third phase, when ability to hang by the hands returns, might serve as a warning of serious mental defect.

CARDIOVASCULAR SYPHILIS

THE early diagnosis of syphilitic aortitis is as difficult as any in clinical medicine, and, as O'Farrell[1] says, involvement of the aorta is so constantly present in cardiovascular syphilis that other forms may be disregarded with few exceptions.[2] Most pathologists now agree that syphilitic involvement of the myocardium is exceedingly rare. Among recent attempts to make the diagnosis of early specific aortitis easier is that of Maynard,[3] who gives the following six criteria to look for: (1) a definite history of syphilitic infection; (2) the absence of any evidence of other disease that might dilate the aorta; (3) a patient aged 40 or less; (4) radiological evidence of dilatation of the aorta; (5) a hollow, accentuated aortic second sound; (6) a systolic murmur in the aortic area. O'Farrell rightly points out that the second of these criteria is often the most important, and the main difficulty here is the exclusion of the dilated, tortuous aorta of "arteriosclerosis." An enlarged left ventricle without aortic incompetence makes aortitis unlikely, but since an appreciable number of cases of specific aortitis are complicated by hypertension the final decision may not be easy. A valuable point which O'Farrell does not mention is the increased density of the aorta detectable on screening in many syphilitic cases. The late stage of aortitis—aneurysm of the aorta—is as a rule easier to diagnose, especially if radiology is employed in all cases of suspected heart disease or pain in the chest, though the time-honoured classification of aneurysms into those of signs and those of symptoms has now had a third category added to it—those with neither signs nor symptoms. O'Farrell suggests that aneurysm of the first part of the aorta is particularly difficult to diagnose, but actually these are the cases in which the aortic valve is most likely to be involved and it is usually not long before an aneurysm in this area shows itself by pulsation in the chest wall. A commoner difficulty lies in mistaking pulsation to the right of the upper part of the sternum due to aortic incompetence for an aneurysm. It is regrettable that O'Farrell supports the old teaching that it is possible to differentiate between the murmurs of rheumatic and syphilitic aortic incompetence by their site, the former being supposed to be maximal to the left of the sternum and the latter to the right. The relationship of syphilis to coronary disease deserves further investigation, especially in these days when doctors are becoming so coronary-conscious. In the past we may have been too apt to attribute symptoms and signs to syphilis, but so far as coronary disease is concerned we are now swinging too far in the opposite direction.

Consideration of cardiovascular syphilis leads to one certain conclusion—that prevention is easier than cure, and that the first essential is to treat every syphilitic efficiently at the time of primary infection. As a further precaution all people who have had such an infection should have their heart examined, clinically and radiologically, once or twice every year.

1. O'Farrell, P. T. *Irish J. med. Sci.* November, 1940, p. 731.
2. Burke, E. T. Venereal Diseases, London, 1940.
3. Maynard, E. P. *Brooklyn Hosp. J.* 1940, 2, 69.

ENDOCRINES AND INVOLUTIONAL MELANCHOLIA

THAT endocrine therapy should fail to influence depression at the menopause has always seemed like a muffed conjuring trick. The state of the patient strongly suggests some degree of endocrine imbalance, and bearing this cardinal fact in mind R. E. Hemphill and Max Reiss have attacked[1] the problem again. The imbalance, they believe, is more likely to be complex than simple, so they have attempted to classify the types of endocrine abnormalities found in a series of 30 women admitted to hospital with depression associated with the menopause; only 4 of them had a history of previous attacks of depression.

They were grouped tentatively as follows: type 1, hypo-ovarian secretion (11 cases), patients with menstrual cessation or irregularity, fat deposition round the lower abdomen and thighs, and symptoms of flushing and giddiness; type 2, hypo-ovarian and hypothyroid secretion (4 cases), patients with menstrual irregularity, few somatic symptoms, dry skin, falling hair, and a small impalpable thyroid; type 3, hypo-ovarian and hyperthyroid secretion (7 cases), patients with menstrual irregularity, somatic symptoms, moist sweating skin, increased pulse-rate, full thyroid and in 2 cases exophthalmos; type 4, hypo-ovarian and hypo-adrenal secretion (8 cases), patients with acute loss of weight, sallow complexion, flabby muscles and skin and an impalpable thyroid. Patients of type 1 were depressed and quiet; patients of types 2 and 4 showed motor agitation; the type-3 patients reacted more acutely to changes in their environment than the others, and 4 of them were suspicious, almost paranoid. It may or may not be significant that 9 of the type-1 patients had never borne children. Gonadotrophic hormone is said to be increased in the urine of women after the menopause; in this series it was not a constant finding but was common in types 1 and 3. Since folliculin inhibits the production of gonadotrophic hormone, follicular hormone was given to 19 patients in the series in large doses, both by mouth and parenterally. Of 7 type-1 patients treated in this way, 3 made complete and 2 partial recoveries; the other 2, who had had symptoms for more than two years, showed no change. Of the 4 untreated patients in this group, 2 recovered and 2 showed no change. Type-2 and type-4 patients treated with follicular hormone were not improved. Of 5 type-3 patients treated 3 improved sufficiently to go out and the other 2 were symptom-free at the time of publication of the report;

1. *J. ment. Sci.* November, 1940, p. 1065.

the 2 untreated patients in this group both showed slight spontaneous improvement. Hemphill and Reiss got the impression that follicular hormone tended to aggravate symptoms in patients in whom thyroid function was diminished (type 2). Luteal hormone had no effect on patients of any type. The only other success was with a type-4 patient who had shown no improvement for two years and who recovered dramatically after injections of the corticotrophic hormone of the anterior lobe of the pituitary; 2 other patients in the same group showed improvement on this treatment.

The series is too small to justify even the most tentative conclusions, and the recovery-rate among the controls was high enough to make the causes of success questionable in those cases which improved on treatment, but the value of the work lies in the scientific approach and the attempt to analyse the endocrine components of the condition.

Special Articles

IMMUNISATION AGAINST BACTERIAL TOXINS

Being an abstract of the second Harben lecture delivered at the Royal Institute of Public Health and Hygiene on Dec. 10 by Lieut.-Colonel H. J. BENSTED, M.C., M.R.C.S.

SOME diseases are dangerous because of the poisonous effect of bacterial toxins, and if the toxin is destroyed—at least in the case of tetanus and diphtheria—the bacteria rapidly disappear from the body. It may be possible, by using bacteriostatic agents, to limit the multiplication of the bacteria, but until the toxins have been neutralised the illness cannot be completely arrested. Some of these toxins have specific affinities for certain cells, and once they have reached these cells they become fixed; the toxin must be neutralised, therefore, before such fixation is possible. The tetanus toxin has an affinity for the anterior-horn cells which it reaches along the path of the nerves; once infection has been established and the toxin is being produced, there is always a race to neutralise it before it reaches those cells. Theoretically it should be possible to saturate the cells rapidly with a relatively harmless drug which would keep the toxin from gaining access to them long enough for the patient to immunise himself. This may partly explain the success of hypnotics in the treatment of tetanus, but their application as a form of treatment is limited.

The aim of immunisation in this group of diseases is to supply the body with enough antitoxin to make neutralisation possible at the earliest possible moment. This may be done by injecting relatively large amounts of antitoxin whenever there is an immediate risk of infection or by stimulating the body in advance to produce sufficient antitoxin of its own to neutralise the toxin as it is produced. If passive immunisation is to be effective the antitoxin must be given early and the dose must be repeated at intervals while the risk of infection persists. Any method which ensures the presence of basal antitoxin in the blood over long periods is to be preferred. The toxins of tetanus are readily modified by formalin, and toxoid made in this way may be injected into the body without harm and is highly antigenic.

TETANUS

There was little danger of tetanus in civil life when traffic accidents were rare, but it is one of the major horrors of wars, especially European wars. It is most common in wounds sustained on highly cultivated or manured ground. In the war of 1914–18, before specific prophylaxis had been introduced as a routine, the incidence of tetanus was about 9 per 1000 wounded. This was during a period of mobile warfare when there were often long delays before the wounded received full medical attention. Once administration of tetanus antitoxin to every wounded man became routine, the incidence fell to a little over 1 per 1000 wounded. One cause of this reduction, however, was the change from mobile to static warfare; there was less delay in taking the wounded to a medical post where antitoxin was available.

When Ramon reported his success in immunising the French army by means of anatoxin, Boyd, at the Royal Army Medical College, undertook an investigation in collaboration with the Wellcome physiological research laboratories which led to trial of the following preparations:—

1. Tetanus toxoid-antitoxin floccules prepared on the lines used for the production of diphtheria T.A.F. This gave a poor response and could not be recommended.

2. Tetanus toxoid (Ramon's anatoxin) prepared by exposing a highly potent tetanus toxin to the action of formalin at incubator temperature for 3–4 weeks. Given in two doses of 1 c.cm. each with an interval of six weeks between the injections, this produced a satisfactory response. The antitoxic titre ranged between 0·02 and 1·0 unit per c.cm. of the blood-serum tested, but remained at a fair level for long periods; the injection of a third dose 6–9 months after the second pushed up the titre rapidly. Reactions after the injections were negligible except for occasional anaphylactic phenomena after the second dose.

3. Alum-precipitated tetanus toxoid (A.P.T.), given in the same dosage and at the same interval as tetanus toxoid also gave satisfactory results but the titres were not much higher unless the interval between the doses was considerably extended. The material tends to produce induration at the site of the inoculation; the nodules are quite harmless and the slow absorption of toxoid from the indurated region may well be an important factor in the high immunising power.

Immunisation with two doses of plain toxoid with a six-weeks interval was introduced into the Army more than a year before this war began. When it broke out over 90% of the troops in the forward area were fully protected against tetanus. Injection was voluntary, so that 100% of inoculated men could not be expected; moreover, some of those inoculated may not have responded adequately. For these reasons all wounded men should be injected with a single dose of 3000 units of tetanus antitoxin, and those who have not been immunised should be given two subsequent doses of 3000 units of antitoxin with a week between.

The severe fighting before the Dunkirk evacuation provided a good test. Many men arrived in this country five or six days after being wounded without having received their initial dose of tetanus antitoxin. Amongst the small percentage who were unprotected by active immunisation, 8 cases of tetanus were reported, while among the large proportion who had been actively immunised not a single case of tetanus developed.

Most civil casualties are admitted to medical posts soon after being wounded, and can immediately receive their initial dose of 3000 units of tetanus antitoxin. The advisability of actively immunising members of civilian organisations who are especially exposed to risks has been fully considered by the authorities, and arrangements are being made for voluntary immunisation of those who wish it.

GAS GANGRENE

Gas gangrene is a clinical diagnosis, and the mere presence in a wound of *Clostridium welchii* or other members of this group of pathogenic spore-bearing anærobic bacteria does not necessarily mean that clinical signs are present. These do not develop unless the local conditions permit the bacteria to multiply and produce their toxins in increasing quantities. The toxins overcome local resistance and allow the bacteria to spread and to continue to produce toxins. The infection then becomes generalised and grave. In the later stages of the last war an antitoxin was introduced, but most workers found it unsatisfactory. Today the prophylaxis of gas gangrene depends on early surgical intervention and the use of sulphonamide drugs. Antitoxin is nowadays only used as an adjunct to surgery and chemotherapy. Active immunisation against gas gangrene has not advanced beyond the experimental stage.

DIPHTHERIA

Diphtheria may appear as an infection of war wounds as well as in epidemic faucial form. In the last war many extra-faucial diphtheritic lesions were contracted during the dressing of wounds. There were also considerable numbers of so-called "desert sores" in the Near East, from which diphtheria bacilli were cultivated.

In 1935 during the North-West Frontier operations I investigated an epidemic of mixed faucial and extra-faucial lesions in a single regiment. The outbreak was protracted, and characterised by a high proportion of non-immunes (nearly 30% of the regiment) and a high carrier-rate amongst the immunes. Most of the cases occurred while the men were in hospital or barracks. Spread was limited by segregation, but it was not until immunity had been established by the administration of toxoid-antitoxin floccules that cases ceased to arise. Seven weeks from the first injection of the prophylactic all but 3% of the original non-immunes were Schick-negative.

The investigation demonstrated the ease with which diphtheria bacilli can be conveyed from an infected wound to a non-infected wound, either by direct cross-infection during dressing, or from wound discharges and mouth droplets drying on bed coverings and being disseminated later through the air.

The menace of direct infection in air-raid shelters is generally appreciated and the introduction of bunks may lessen the chance of a diphtheria carrier passing on the organism by direct projection of droplets. It is often forgotten, however, that the bacilli can remain viable in dried secretions, and may be disseminated when blankets are shaken in the air or dust on the floor is disturbed.

Dispersal of children from cities has done much to reduce the dangers of urban outbreaks of diphtheria, but city children generally include a larger proportion of immunes (either natural or immunised) than children in small country districts. Carriers among such children sent to live with families of non-immunes may originate an outbreak, and there is already evidence of diphtheria occurring in villages as a result of infection imported by child carriers from the town.

The immunity to diphtheria acquired from active immunisation is lasting—possibly for life. If it had been more widely practised during the last ten or fifteen years among children, especially those of preschool age, the danger of diphtheria would have been largely eliminated. To attempt now to immunise the high proportion of the non-immunes among young adults, whether in the Services or in the civil population, is a large undertaking. Any scheme for mass inoculation must first be applied to children of preschool age; the other age-groups can then be dealt with in an ascending order.

The two prophylactic agents commonly employed in this country are toxoid-antitoxin floccules (T.A.F.) and alum-precipitated toxoid (A.P.T.) Both these preparations depend primarily on the detoxication of a potent toxin by the action of formalin. A.P.T. is the more active and is the agent of choice for young children; reactions rarely follow its use in this age-group. It is usual to give 0·1 c.cm. intramuscularly as the first dose; if there is an excessive local reaction the second dose should consist of 1 c.cm. of T.A.F. after about three weeks. If the reaction is trivial the second dose should consist of 0·5 c.cm. of A.P.T. after an interval of a month. For the immunisation of older children and adults T.A.F. is to be recommended. It is only slightly less efficient as an immunising agent than A.P.T., and is the least likely of all prophylactics to cause reactions. It is usual to administer it in three doses of 1 c.cm. with four weeks between the first two doses and two weeks between the second and third.

Combined active and passive immunisation has an important place in dealing with non-immunes immediately exposed to the risk of infection. There is usually no time for Schick testing; antitoxin should be given together with A.P.T. or T.A.F. In this way the prepared antibody will protect the individual until the toxoid results in the production of sufficient antitoxin for basal immunity to be established.

ST. LOYES' TRAINING CENTRE

To make the best use of a crippled limb depends not only on the gravity of the crippling, but on the character of the injured person. Even an idle and dispirited patient can gain confidence and enthusiasm in the right surroundings, especially if he is in the company of others as luckless as himself, but more determined. Crippled boys and men coming to St. Loyes' training centre have a choice of several occupations suited to their inclinations and abilities. In the horology workshop about twenty or thirty students are learning watchmaking. Youths with gross physical disability may yet develop great dexterity in handling delicate tools. A beautifully made clock in the workroom is evidence of their skill, every part of it having been made by hand by the students themselves. The workshop is an economically effective unit; watches are sent to it for repair, checked in by the storekeeper (a boy with a flair for accounts and forms), fitted with any necessary new parts which are made by hand in the toolroom, cleaned when necessary, assembled, adjusted and sent out again.

Students with an ability to design are taught machine-drawing, and learn to design and make not only watch-parts, but tools and special modifications of the machine-room equipment. Mr. H. Kendall Towy, the instructor, finds that it is impossible to assess the capabilities of a student early in his training; he has many times despaired, but egged on by the chairman, Dame Georgiana Buller, has persevered with what looked like a hopeless case—to turn out a capable workman in the long run. Jobs are usually found for the fully trained workers, though St. Loyes' does not guarantee to place them. Only very occasionally does a St. Loyes' worker prove unsuitable for the job found for him, and then he generally settles down well in a different place. The great advantage of watchmaking as a trade is that the demand is always there, and that a free-lance worker can do the job sitting at the kitchen table in his own home.

Students with no mechanical bent are trained in cookery, domestic work, catering, gardening, the duties of a handyman or clerical training. The training centre consists of two large houses set in fine gardens and fields. The kitchens and houses offer scope for domestic training and the office work gives opportunity for clerical training. In the garden students learn not only the general care of lawns, flower beds and kitchen gardens, but the management of greenhouses and frames; they study drainage, soils, rotation of crops and the discomfiture of common pests.

There are dormitories and recreation rooms in both houses and in one a small stage for concerts. Out of doors a cricket field is no mere ornament in this cripples' home. They play keenly and arrange matches with other institutions.

The centre also offers a rehabilitation course for workers disabled by accident. This is conducted by a trained occupational therapist and is well equipped with looms, and material for handicrafts. The instructor finds that in order to get a given group of muscles working properly she often has to modify her equipment to suit the case. At one loom she had harnessed the injured man's feet to the treadles by light straps and cords, so that he was forced to bend his knee at each change; at another loom she had hung a sling from the top of the frame so that the patient had to perform all his finger and forearm movements with his arm above shoulder level. Her ingenuity is constantly being tested, and this is proof, if any is needed, that occupational therapy must be managed by a trained and experienced worker, and is a curative process not to be confused with jig-saw puzzles and a little wool-work to pass the time.

On the designation of the Most Reverend J. C. McQuaid to the Archbishopric of Dublin the president and fellows of the Royal College of Physicians of Ireland have presented him with a medieval gold ring with a large amethyst. It is of the type known as a Borgia ring, and came into the custody of the college a few years ago from the collection of the late Sir F. Conway Dwyer. Dr. McQuaid was for many years president of Blackrock, and many of his pupils have become licentiates of the royal college. He has close family connexions with the medical profession, for his great-grandfather, grandfather and father were doctors.

Public Health

From the Annual Reports

IN the course of our notices of the 1939 reports we shall have many occasions to record levels of health never before attained, and, though 1939 was undeniably an exceptionally healthy year in all parts of the world for which reliable statistics are available, we must credit the health services with having brought this about. Naturally healthy years have been frequent in past times and each as it came along gave us new low levels of death and disease, each in its turn surpassing those which had gone before. The health services of Britain reached their acme in 1938 and after the crises of September of that year they declined somewhat rapidly; so as regards the services themselves 1939 was a very unfavourable year. This would not affect the health of that year to any great extent, but must be expected to do so in 1940 and subsequent years of warfare. It will be remarkable if the record of 1939 is broken until at least three years after peace has been restored.

Dr. Stephen Rowland, of *Northampton*, reports that 1939 was the second year in succession without a maternal death. This together with the satisfactory death-rate of 11·6, reduced by the comparability factor to 11·2, a low infantile mortality of 41·7, a record mortality from tuberculosis of 0·44 per 1000 population, and a very low zymotic death-rate "would seem to be substantial grounds for believing that the sanitary circumstances of Northampton remain satisfactory." The population of Northampton in mid-1939 was estimated to be 96,546; the number of births was 1190 and of deaths 1155. The births in 1938 were 1203. The absence of maternal mortality in 2393 consecutive births is certainly as encouraging as it is exceptional. Another unusual but unfavourable item in the vital statistics is that 29 deaths were uncertified. In September, Northampton received 16,944 persons evacuated from the London area, chiefly from Willesden, but by the end of the year all but 6717 had returned home. Amongst the specials were 286 blind persons, but of these only 108 remained in Northampton by February, 1940. Not much has been said of the special difficulties experienced by reception areas in accommodating blind persons, but various medical officers have found the blind contingent a very serious problem. Dr. Rowland says little about the blind he received apart from recording that nearly two-thirds of them returned home long before the battle of London started. He does, however, refer to the difficulty he had in billeting expectant mothers before and after confinement, "especially when one considers the large proportion of these immigrants who were of a class not frequently seen in Northampton." Most of the mothers went straight back to London as soon as they had got over their confinements, so easing a position which threatened to be "impossible." In this matter Northampton was in no different case from other areas receiving this priority class of evacuants, and probably there, as elsewhere (though Dr. Rowland does not say so expressly), the local residents were suspicious that some of the expectant mothers they were asked to billet were of doubtful virtue and still more doubtful freedom from venereal disease. There were a number of such undesirables in every contingent and the receiving authorities were rarely in a position to assure a receiving householder that the woman they desired to billet upon her was not of this class. This seems to have been the chief difficulty and it might have been foreseen.

In *Salford* the death-rate was 14·3, an increase of 0·5 on the rate for 1938, and the birth-rate fell by 0·9 to 14·9. The infantile mortality dropped to a new level of 69. Dr. H. Osborne suggests that the uncertain conditions prevailing since the crisis of 1938 may have adversely affected prospective parenthood, and that the absence of measles in 1939 may in part account for the record infantile mortality. In September, 1939, there was an evacuation to Blackpool of 406 expectant and nursing mothers and 269 children which might have influenced both the birth and infantile-mortality rates. Dr. Osborne's report is unusually full for one of 1939, which suggests that it was prepared before the receipt of the circular of the Minister of Health calling for reports cut down to the minimum, and it is therefore unusually interesting. At the census of 1931 the population of Salford was 223,438 but by mid-1939 it had sunk to 196,600, which left it with a density of 37·8 persons per acre. The death table for 1939, which is not exceptional for Salford, shows that of 2703 deaths registered 1265 occurred in persons over sixty-five. Of these, 179 were due to cancer—half of the total cancer fatality—but only 52 were due to pneumonia, that being little more than a quarter of the total fatality of this disease (201). Of persons between forty-five and sixty-five 789 died; this is a high proportion, containing 149 deaths from cancer, 319 from cardiovascular diseases, 68 from tuberculosis, 50 from pneumonia, and 52 from bronchitis. The age-period twenty-five to forty-five gave 284 deaths, also a somewhat high number. Of these, 77 were due to tuberculosis and 22 to pneumonia. Of the 202 deaths of infants under one year 58 were due to pneumonia. So a quarter of all infant deaths were due to pneumonia and a quarter of all pneumonia deaths occurred in infants of less than a year. Since 1915 the highest number of births in any one year was 6441 in 1920 and the lowest 2925 in 1939, the reduction having been almost regular for nineteen years. Since 1878 the five-year average birth-rate fell continuously from 41·5 to 15·0, the greatest drop being from 22·3 in 1918–22 to 18·9 in 1923–27. The death-rate was fairly constant at about 25·6 until 1892; it then fell fairly regularly to 13·6 in 1927, since when it has tended to increase slightly. In sixty years the death-rate from zymotic diseases fell from 5·4 to 0·4; that from phthisis from 2·7 to 1·0; that from nervous diseases from 3·5 to 0·9, and that from bronchitis from 3·6to 0·9. The cancer-rate increased from 0·5 to 1·7, and the heart-disease rate from 1·1 to 2·8. The pneumonia-rate fell from 1·8 to 1·1 but all the fall here took place since the last war. In the first year in which poliomyelitis was notified (1912) there were 29 cases, but since then the maximum number was 7 in 1915 and the average number about two per annum. Cerebrospinal fever, which also first appears on the notifiable list in 1912, averaged 6 cases per annum until 1933 when there were 13 notifications. The greatest incidence was ·22 in 1936. Encephalitis lethargica first appears in 1919. In six years 26 cases were notified altogether but in 1923 the number jumped to 59. It declined to 27 in 1924, and then gradually disappeared. Since 1934 only 2 cases have been notified, one in 1935, the other in 1938.

Dr. Rutherford Cramb, of *Brighton* county borough, starts his report with a reference to the retirement of his illustrious predecessor, Dr. Duncan Forbes, in April 1939. The last three years have seen the passing from active service of many of the hygienists who built up the health services of the inter-war period. They did well, but we expect their successors to do better when they have the chance, so perhaps it will eventually prove to be an advantage that those who must reconstruct the services when peace comes were appointed during these troublesome times, when owing to unavoidable curtailments there is the chance of jettisoning functions which had become obsolete, or were of indifferent value. Brighton was a reception area in September 1939 and Dr. Cramb feared, as did most medical officers of reception areas, that the reception would adversely affect the vital statistics, especially infantile-mortality, maternal-mortality and infectious-disease rates. Actually these fears were unrealised. In Brighton the infantile mortality in 1939 was 45, the second lowest in its history, and the maternal mortality 3·2 against 3·0 in 1938. The low maternal mortality of evacuated mothers has been as striking as it was unexpected, and may be due to the comparative rarity of uterine inertia amongst them. In Brighton in 1939 there were only 36 notifications of puerperal sepsis in 2014 deliveries, against 68 in 1938. Dr. Cramb mentions his indebtedness to the Central Midwives Board, who, whenever requested to do so, sent highly trained and competent midwives to help with the increased pressure on the midwifery service. Without a doubt the Central Midwives Board, which before the war had no reputation for liveliness, rose to the war emergency with vigour and promptitude, which other central authorities did not. There were no deaths from measles, scarlet fever or enteric, only 4 from whooping-cough, 5 from diarrhœa (under two years of

age) and 3 from diphtheria. Amongst 47 notifications of erysipelas there was only 1 fatality, in spite of 4 of the patients being under five and 10 over sixty-five years of age. The fall in fatality of erysipelas has been one of the most remarkable triumphs of medicine in the last few years and with confidence can be attributed to treatment with the sulphonamides, for until their advent the fatality had remained remarkably constant for as long as records are available. There were 5 notifications of poliomyelitis and 7 of cerebrospinal fever, of which 2 ended fatally.

The county borough of *Bootle* has a population only a third that of Salford but since its birth-rate in 1939 was 21·1 it contributed more than half as many new citizens. Its stillbirth-rate was 38·1 against Salford's 45·4, and its infant mortality 65 against 69. Since the last war the birth-rate was highest at 29·7 in the first quarter of 1920 and lowest at 20·1 in 1938. In Salford the rate for 1920 was 27·3 and its nadir 14·7 in 1934. This is a striking contrast, which may be explicable by difference in race with different attitudes towards contraception. Dr. F. T. H. Wood records that 31 or 3·5% of all deaths were uncertified. There are no slaughterhouses in Bootle, which is rather surprising even though Bootle is practically a suburb of Liverpool. Only 8 cases of puerperal pyrexia were notified, but since 5 of them died it is obvious that puerperal pyrexia is not notified in accordance with the requirements of the Public Health Act 1936. A fatality-rate of 60 is exceptionally high in puerperal septicæmia and impossible in puerperal pyrexia. There was no notification of cerebrospinal fever and only one of poliomyelitis. On the other hand diphtheria was highly prevalent, 326 cases being notified, which gives an incidence-rate of 4·53 per 1000 population. Its fatality was, however, only 5%, which gives a mortality-rate of 2·2 per 10,000, about double the rate for the country as a whole, but all the same nothing out of the common, for all districts have good and bad diphtheria years. The mortality from tuberculosis was 1·08, exactly half of what it was in the last decade of the nineteenth century. It is still high, for in the country as a whole the fall in the present century is from 2·01 to 0·63, but compares favourably with other towns in Northern England.

Infectious Disease in England and Wales

DURING THE WEEK ENDED NOV. 16, 1940

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1684; whooping-cough, 2032; diphtheria, 1408; enteric fever, 22; measles (excluding rubella), 13,114; pneumonia (primary or influenzal), 698; puerperal pyrexia, 128; cerebrospinal fever, 129; poliomyelitis, 22; polio-encephalitis, 5; encephalitis lethargica, 4; dysentery, 97; ophthalmia neonatorum, 72. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on Nov. 22 was 1730, including: scarlet fever, 298; diphtheria, 272; measles, 589; whooping-cough, 46; enteritis, 44; chicken-pox, 179; erysipelas, 32; mumps, 22; poliomyelitis, 2; dysentery, 2; cerebrospinal fever, 25; puerperal sepsis, 6; enteric fevers, 13; german measles, 11; other diseases (non-infectious), 59; not yet diagnosed, 130.

Deaths.—In 126 great towns, including London, there was no death from smallpox, 4 (0) from enteric fever, 1 (0) from scarlet fever, 10 (1) from whooping-cough, 20 (0) from measles, 52 (3) from diphtheria, 28 (3) from diarrhœa and enteritis under 2 years, and 33 (3) from influenza. The figures in parentheses are those for London itself.

Birkenhead reported 2 deaths from enteric fever, Greater London, Sunderland, and West Ham each 1. Fatal cases of diphtheria were scattered over twenty-one great towns, Liverpool reporting 13, Plymouth 5 and Cardiff 4. There were also 8 deaths from measles at Liverpool.

The number of stillbirths notified during the week was 185 (corresponding to a rate of 40 per thousand total births), including 14 in London.

The title of professor of physics as applied to medicine in the University of London has been conferred on Mr. W. V. Mayneord, D.Sc., in respect of the post held by him at the Royal Cancer Hospital (Free).

In England Now

A Running Commentary by Peripatetic Correspondents

IN 1932 I described my "Doctor's Day" as a consulting physician, which often extended from 9 A.M. to midnight and sometimes later—a fifteen or sixteen hour day with a maximum of three hours for rest and refreshment. The picture I drew looks highly coloured now, but it was a fair composite one of average days. The physician's time was divided between his private practice and his hospital work. I pointed out how the proportion which his honorary contributions got depended on the elasticity of his conscience; how one man boasted of his generosity if he gave up four hours a week, while another willingly gave the sick poor four times as much time, and allowed nothing except illness or extreme inconvenience to keep him from the hospital. How one man by invariable absence from committee meetings avoided the time-consuming incubus of officialdom, while another through punctilious attendance was rewarded by a place on every subcommittee elected to report on the thousand and one odds and ends referred from the lay board. I represented myself as striking the happy mean between ultra-conscientiousness and shabby disloyalty. Lectures to students or post-graduates; correction of examination papers; dinners, with the inevitable speech if a reputation had to be acquired; meetings of medical societies, with the presentation of a paper or at least participation in the discussion; material to be extracted for an article or a textbook; current journals to be skimmed or studied, for the teacher had to be, or appear to be, omniscient; private practice at home, consultations at a distance; and unlimited correspondence. What a life! And yet there was room for enough exercise to keep physically fit, and for enough social intercourse and recreation to avoid priggishness and narrowness of outlook. Only these had to be regarded as details which filled in unexpected gaps.

In those days I sometimes wondered what was the measure of private practice of a really busy consulting physician in the forefront of popularity. Sir Humphry Rolleston, in his Life of Sir Clifford Allbutt, describes how in 1892 Dr. Alex Hill, the master of Downing College, came on behalf of the medical faculty of Cambridge to invite Sir Andrew Clark, then president of the Royal College of Physicians, to accept the regius chair of physic. We read that "they talked it over for two hours, whilst some thirty patients waited for their morning appointments." Thirty patients! Many a consultant of my day would have read this casual observation wistfully or with envy. Enviously, in times of slackness or depression, as evidence of the popularity of his predecessor; wistfully, in times of stress, because that predecessor was able to work on such a basis. Those were the days when a glance at the tongue, palpation of the pulse, a formal application of the stethoscope, and a few words of unquestioned opinion and advice were accepted as a reasonable consultation. Contrast this with 1932: the preliminary anamnesis, the inspection and assessment of radiograms, electrocardiograms, pathological reports and the opinions of antecedent specialists and consultants; the physical examination, requiring the application of sundry instruments of precision which however automatic demand an irreducible minimum of time. Rarely did the interview end with the patient and his own doctor; more often it was continued by a number of relations labouring under the delusion that their presence was vital lest some crucial point in the history should be overlooked, and only too willing to spend the entire morning in what they considered a good cause. Even when these had been eliminated and verdict and sentence pronounced, it was not unusual for the patient's doctor, somewhat shamefacedly repudiating responsibility, to announce that his wife had requested that Dr. A should run the rule over him while he had this chance. Nor was it unknown for the doctor to bring up a daughter as well for an opinion, and he wanted to talk over a very interesting problem he had recently encountered, and to have a few minutes' gossip of the days when they were on the house together. One did very well if an

allowance of three-quarters of an hour per patient was not substantially exceeded, and if six, or at the outside eight, patients were seen by working at extreme pressure throughout a long morning.

What of today? Anthony Trollope in his autobiography said "We all of us adapt ourselves to the circumstances around us. Though three parts of London were in flames, I should, no doubt, expect to have my dinner served to me if I lived in the quarter which was free from fire." It is, as he said, a matter of adjustment. We have little to do but it would be difficult to do much more. My day is nearly as long as it was in 1932, but I think myself lucky if I achieve five hours of honest application. Much of the remainder is sacrificed to transport difficulties and the embarrassments of alerts and the blackout. Our evenings are free. Dinner is consumed in peace with immunity from telephone interruptions, for even if people want to ring us up the authorities won't let them. We have no evening committees, society meetings, after-dinner speeches. There is nothing to entice us from our fireside. What do we do? Alas for those rash resolutions. With leisure in prospect we were to have written a novel, acquired a new language, or even learnt to play a musical instrument. We humbug ourselves with the excuse that it is impossible nowadays to concentrate. Yet in fifteen months I have read a big textbook on neurology, a still larger one on treatment, two moderate-sized ones on cardiology and one on pharmacology, as well as all the journals to which I have had access. I believe it would have been better to have applied myself to some earlier classics, and acquired a thorough grounding in the rudiments. All this I advance apologetically and in no spirit of boastfulness. My reading has been a salve to an hypertrophied conscience, a sort of mental anodyne, or if you will a form of addiction.

What of the future? We are assured by those entitled to speak with authority that the old conditions can never return. Perhaps, and perhaps not; prophecy is always hazardous. The capacity for recovery is inestimable, and although we old stagers will not have the courage, the vitality and the enthusiasm to continue the struggle or make another start, our juniors may again achieve the sort of professional life to which we were accustomed, with its vicissitudes, its disappointments and its prizes.

* * *

The brain has been likened to a master with many servants, some serving him ill, others well. Experience shows that the imperious master drives his servants too hard. Restless ambition and insatiable curiosity grow upon him as, with scientific developments, the panorama of life enlarges and its interests grow. The various serving systems and organs are mainly what heredity made them. Under the drive the weakest fall by the way. The ruthless tissue of the brain is finally the victim of the retainers it has abused. Arrogant to the last, the master sinks in sullen splendour into the abendland—the west. For the middle-aged and elderly the week-end habit would be a blessing if the time were spent in bed.

Paranoiacs and persons with obsessions commonly have morbid mental heredity. Watching them, one might conclude that their condition would exhaust them physically. But no; paradoxically, perhaps, they have "strong brains," good health, and commonly live a long time. On the other hand, people in whom no such inheritance can be found take on some strenuous mental task, develop impaired self-control, become irritable, unable to concentrate, show faulty judgment, sleep badly. They have "weak brains." To order the former to rusticate midst fowls, ducks and geese would be silly; the latter one might. Another way would be to give them real insomnia by divers means, keeping them in hospital for close watching—a fright-producing treatment, from which they might learn their cerebral limitations and thereafter live on a humbler mental level.

* * *

There have been many illustrious physicians whose lectures and bedside teaching were valuable, especially to senior students and postgraduates, but who were disappointing when the last stage, that of treatment and prescribing, was reached. Amongst these was Sir Samuel Wilks, than whom I consider no more distinguished physician has occupied the chair as president of the College of Physicians (1896). I have known him, when asked at the close of one of his original and fascinating bedside discourses what should be prescribed, to reply "I usually leave the prescribing to the 'ousepysician," or "sister, what would you prescribe?" He expressed the view that the best prescription for the Guy's Pharmacopœia would be the hospital park. In those days there really was one.

* * *

American students are not so numerous in England now. A few remain, however, and make their contribution to life in the blitzkrieg. Their quaint phraseology and self-confidence are as characteristic of the New World as the Englishman's Norfolk jacket and protruding teeth are symbolic of the Old. In a tutorial class in pharmacology the other day, I asked an American to distinguish between a vermicide and a vermifuge. The definition of a vermicide offered no difficulty, but he faltered over vermifuge. Finally, mobilising all his histrionic resources while his colleagues listened with growing amusement, he said emphatically: "Well, when the worm spots the anthelmintic coming through the pylorus, I guess it just beats it to the rectum."

* * *

Conservatism isn't just a political creed in England. I believe it's bred in the bones. The other day I was visiting a model shoe factory set up by a Czecho-Slovak firm. It has an excellent paternalistic welfare system, and has built good houses near the works—semi-detached—which it rents to the working people for 10s. a week. The first houses built were very modern, of continental design with flat roofs, but the workers disliked them so much that in the end the management had to give way and build typical English working-class houses with slanting roofs, and these have been enormously popular. What difficulties our post-war planners will have to face. Incidentally the factory offered free inoculation to the workers against typhoid and diphtheria, but only 7% took advantage of the offer.

* * *

In this ancient Scottish university we have our college club. Its members are drawn exclusively from the teaching staff, and in no circumstances are undergraduates allowed in the rooms. The club fosters closer relationships between the members of the different faculties. There appears to be a positive chemotaxis between the mathematicians and the medicals. The lowest common denominator is to be found among the geologists: they are welcomed by every group. The chemists, on the other hand, seem to be self-sufficient; for most of us it is a relief to escape for a time from the medical outlook and see the world through the eyes of a musician, a naval architect or perhaps a specialist in Arabic. Sitting near me at luncheon the other day there was a strong contingent from the divinity school, including a brace of ex-moderators. The conversation veered round to continental holidays. Biblical Criticism was recalling the pleasures of walking tours abroad; he had "done" a good deal of Germany in this way, and he said he looked forward to invading the other end of the axis some day. "Walking in Italy will be strenuous," commented Christian Ethics. "A car or at least a motor-bicycle would be helpful." "To lock up my car in its garage is the indispensable preliminary to an enjoyable holiday," observed Biblical Criticism somewhat pontifically. "If that's the kind of car you have," commented Semitic Languages, smiling, "you would certainly need fluent Italian or you must be able to undertake your own running repairs." "Unhappily," returned Biblical Criticism, looking at his colleague over the top of his steel spectacles, "I am an indifferent motor mechanic, and I cannot claim to be proficient in conversational Italian; but as Mussolini made the study of Latin compulsory in Italy a few years ago, I think I might make myself understood. . . ." "Yes," agreed one of the ex-moderators, "but you would soon be in difficulties if you were to depend on Latin when purchasing motor accessories. For instance, what is the Latin for a valve?" He looked round inquiringly at his colleagues, but there was no response. Fortunately, I was not invited to supply the information. I reflected, however, that it would be awkward to ask for a valve and be given a folding door.

Parliament

QUESTION TIME

Vitamin Potency of White Flour

Mr. R. DE LA BÈRE asked the Parliamentary Secretary to the Ministry of Food whether, in respect of an American process for retaining the wheat germ and oil in the milling of white flour, he had examined this plan in detail; and if so, would he give the reason or reasons for it being turned down in favour of synthetic vitamin.—Major LLOYD GEORGE replied: The Ministry has obtained authoritative reports regarding flour made by an American process but they do not bear out the claims made for the flour in the matter of germ-content and keeping qualities. His attention has recently been drawn to somewhat similar claims and on behalf of a Canadian process for producing white flour described as of high-vitamin potency and he has arranged to have these claims fully tested.

Supply of Milk

Mr. ROBERT MORGAN asked Major Lloyd George to what extent the existing shortage of milk was partly due to abuses under the free and cheap milk schemes; what reports he had received on the subject, and whether he was aware that persons earning £10 a week, or more, were obtaining milk at half-price.—Major LLOYD GEORGE replied: The existing shortage of liquid milk is the result of a material fall in production occasioned by climatic conditions and reduced supplies of concentrates accompanied by a substantial increase in consumption which is attributable to air-raid conditions, the demands of the Services, the shortage of condensed milk and the introduction of the national milk scheme. As regards the second part of the question the national milk scheme provides for the supply of milk at 2*d.* per pint for expectant and nursing mothers and for children under five years of age without regard to means.

Mr. DAVID ADAMS asked if he was aware that national dried milk was cow's without either added vitamin D or iron salts; that it was now established that for infants up to one year dried milk with added vitamin D was superior to national dried milk alone and that for children above that age vitamin D and iron salts should be added, and that these two grades of milk powder were being supplied by manufacturers to local authorities; and whether, in view of the increased cost and the difficulty in procuring cod-liver oil, source of vitamin D, steps would be taken to supply national dried milk with the additions mentioned.—Major LLOYD GEORGE replied: National dried milk is ordinary milk in powdered form and contains no added ingredients. It is supplied as a substitute for liquid milk for consumption by infants under one year in cases where a doctor certifies that such substitution is desirable. The purpose of the national milk scheme is to provide milk, either liquid or dried, and not composite foods. These are already provided by local authorities for children who need special feeding.

Mr. ADAMS: Is he aware that dried milk has risen in price since Nov. 18 from 1*s.* 6*d.* per packet, equalling seven pints of cow's milk, to 2*s.* 6*d.* per packet; and what steps are being taken to restore this food to a reasonable figure.—Major LLOYD GEORGE: In order to meet the increased costs of producing milk it has been necessary to raise the price of milk for manufacturing purposes to 1*s.* 7*d.* per gallon. The cost of milk required for manufacturing a packet of dried milk prepared from 7 pints of raw milk would therefore be 1*s.* 5*d.* The price of 1*s.* 6*d.* per packet must therefore have been in respect of dried milk manufactured from raw milk before the manufacturing price was raised to its present level.

Heating of Air-raid Shelters

In answer to a question Mr. H. MORRISON, the Home Secretary, stated: I have made arrangements to provide as soon as practicable coal-stoves of a special type or other forms of heating in certain brick surface shelters and trenches which are used for sleeping purposes, in accordance with the recommendations of the Horder Committee. Those recommendations however related to shelters used for sleeping purposes and I do not consider that there is any sufficient justification for heating shelters not so used.

N.H.I. Benefits

Mr. ELLIS SMITH asked the Minister of Health if he had now considered the question of increasing all benefits paid under the National Health Insurance Act; and could he make a statement as to when they were to be increased, and by what amounts.—Miss F. HORSBRUGH replied: The question is being fully explored. It would not, in any case, be possible to introduce before Christmas the legislation which would be necessary to give effect to any decision to increase National Health Insurance benefits.

Medical Welfare Work in Africa

Mr. GEORGE HALL, under-secretary for the Colonies, informed Mr. Creech Jones that financial provision would be made for the construction of African housing at a cost of £31,000; African hospitals and dispensaries costing £10,000; and loans to local authorities, principally for African housing, £50,000. It was proposed also to provide in the 1941 estimates the sum of £5000 for medical welfare work in the Copperbelt in addition to the sum of £9500 already being expended there by the mining companies, Government and the Mines Canteen Fund. The medical services in Kenya had been and would be maintained to the fullest extent possible under war conditions.

R.A.M.C. and Physiotherapy

Sir FRANCIS FREMANTLE asked the Secretary of State for War what arrangements for physiotherapy had been made by the Army Medical Service; and whether advantage had been taken of the services of persons in civil life with expert experience of the subject.—Mr. A. EDEN replied: There are physiotherapy departments in all the more important military hospitals and convalescent depots, to which suitable equipment is supplied in the case of all establishments requiring such equipment. In addition, such departments exist in certain of the emergency medical service hospitals of the Ministry of Health, which are available for the accommodation of military patients who are in need of such treatment. A consultant in physical medicine to the Army and specialists in Army commands have been appointed. Their duties are to advise and supervise the treatment of patients in military hospitals and convalescent depots, and to train Army Physical Training Corps instructors in medical measures. The consultants and specialists were selected on account of their experience in physical medicine in civil life.

Dental Surgeons as Anæsthetists

Mr. GROVES asked the Minister of Health whether he was aware that the Royal Alexandra Hospital for Sick Children, Brighton, and the Royal Sussex County Hospital, Brighton, had appointed dental surgeons as anæsthetists for casualties although medical men were available; whether he would investigate the matter and take steps to terminate the present appointments and appoint only anæsthetists holding medical qualifications.—Mr. MACDONALD replied: No, Sir. I am informed that both these hospitals have arranged for a number of local dental surgeons to receive a special course of training in anæsthetics with a view to acting as anæsthetists in an emergency if medical men were not available, and I may add that several of these gentlemen gave valuable service as anæsthetists at the Royal Sussex County Hospital during the heavy pressure of work on service casualties immediately following the evacuation from Dunkirk. Such arrangements are within the discretion of the hospitals concerned. As the employment of dental surgeons without medical qualifications to act as anæsthetists at both these hospitals is limited to the circumstances indicated I am not prepared to take any action.

Medical Practitioners and Air-raid Damage

Mr. SORENSEN asked whether the Minister was aware that a medical practitioner who lost his home, surgery, and equipment through enemy action, and was therefore unable to continue his practice, secured alternative accommodation with difficulty near to his previous surgery, but had been threatened by the landlord with legal action to prevent his use of the premises, including the shop, as a surgery or consulting-room; and whether he would take steps to safeguard and assist all such medical practitioners in this respect and thus enable them to pursue their practice.—Miss F. HORSBRUGH, parliamentary secretary to the Ministry of Health, replied: The Minister is having inquiries made.

Transfer of Panel Patients

Mr. GROVES asked whether a panel patient whose doctor had been called up for service might forthwith transfer to any remaining doctor whom he might choose or only to the lists of those who had joined the protection of practices scheme.—

Mr. MACDONALD replied: Where the protection-of-practices scheme concerned is on a voluntary basis, the right to transfer after giving due notice is not affected, but immediate transfer can only be made to the list of a participating practitioner. Where however the arrangements have been made by amendment of the insurance committee's allocation and distribution schemes, immediate transfer can be made to the list of any practitioner who is willing to accept the insured person seeking transfer.

Soldier's Death in Isolation Hospital

Sir ADAM MAITLAND asked the Secretary of State for War if inquiries had been made into the circumstances of the death of Signalman Peter Gunston at Towyn Isolation Hospital on Oct. 26; and if such inquiries had revealed neglect or lack of proper medical attention.—Mr. EDEN replied: I have received a full report on this case, and it reveals no neglect or lack of proper medical attention. I should like to take this opportunity of expressing sympathy with the soldier's father and mother.

Ministry of Health Circulars

Miss CAZALET asked how many circulars the Ministry of Health had issued to local authorities since Sept. 3, 1939.—Miss HORSBRUGH replied that the number was 392.

Evacuation of Tuberculous Persons

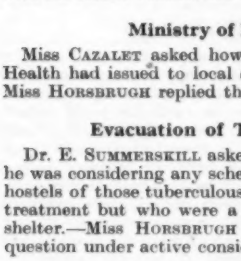
Dr. E. SUMMERSKILL asked the Minister of Health whether he was considering any scheme for the evacuation to suitable hostels of those tuberculous persons who refused sanatorium treatment but who were a source of infection in an air-raid shelter.—Miss HORSBRUGH replied: The Minister has this question under active consideration at the moment.

Obituary

CALEB WILLIAMS SALEEBY

M.D. EDIN., F.R.S.E.

Dr. C. W. Saleeby, eugenist, whose death on Dec. 9 at the age of 62 was reported in our last issue, owed much to his parentage. His father was founder and long head of the Mount Lebanon schools; his mother, who gave him his early education, was daughter of Dr. Caleb Williams of York, a pioneer alienist. He went to the Royal High School at Edinburgh and qualified M.B., Ch.B. Edin. in 1901 with high honours. He held resident posts at Edinburgh and York before coming south to assist Jonathan Hutchinson at the Polyclinic, after which he never left London until last year.



Lafayette

Saleeby is the Arabic for crusader and it was not for nothing that he regarded his patronymic as destiny. His Edinburgh life had already made him thoughtful about the origins of the shady side of human existence, and when he met Francis Galton his lifework crystallised. He became one of the moving spirits of the Sociological Society and waged ceaseless war upon what he called the diseases of darkness. The result of this preoccupation was already visible in an essay published in 1914 under the title Progress of Eugenics. In this essay he aimed at presenting the eugenic ideal in its pure form, disembarrassed of the extraneous and conflicting objects which tended to create prejudice. Advocacy of eugenics, he complained, had been made a pretext for the inculcation of class prejudice, had been used as an argument against love, as a reason for unjustifiable operations, as an excuse for the neglect of infancy, and as an outlet for loose talk about lethal chambers and stud farms. The essay was frankly propagandist and although on every subject touched it showed wide knowledge and enthusiasm it was marred by the complacency which all his life estranged the practising members of his own profession. Time will show whether he made any lasting contribution to the study of racial culture. It is without question that his amazing readiness in popular exposition, his impromptu use of striking examples drawn from common life as they came into his mind, made eugenic principles familiar to countless people who would not otherwise have heard of them. And this intellectual equipment was combined with an imposing presence and an ability to appeal to women on their own ground. He wrote incessantly in books, magazines and pamphlets, always in the same lucid and forcible manner which compelled attention. His connexion with the National Birthrate Commission of which he became chairman gave him access to the thoughts of others at a plastic stage. When the Medical Research Council published their first report on vitamins 20 years ago the conclusions they tentatively drew were already part of the currency of his teaching. He had himself wondered what it was in the diet of the bee that produced a few queens and a host of sterile females, he had thrilled at Lady Mellanby's study of the development of dental enamel in puppies, and he had seen the bearing of Stockard's experimental work on the association of stillbirths with maternal alcoholism. He questioned whether many of the diseases of the fœtus and newly born infant might not be due to defective feeding of the mother, he stimulated research upon the dietary of gravid mammals, and himself coined the phrase "racial poisoning," now in common use, for the action of such agents as lead, alcohol and syphilis on the embryo. It may be that his effectiveness suffered from dealing with causes rather than with people, from concentration on health without the daily contact in the flesh with the conditions that produce deviations from health. But in the last war Lord Rhondda had the sagacity to attach him to the Ministry of Food, and at the beginning of the present war when he retired to Tring he took over honorary consulting work in the minor ailments and antenatal clinics, and his colleagues there are able to speak of his complete devotion to the welfare of his fellow men.

FREDERICK WALLACE EDWARDS

SC.D. CAMB., F.R.S.

Dr. F. W. Edwards, who died unexpectedly after a short illness on Nov. 15 at the age of 52 was known to malariologists and medical entomologists in every part of the world as the embodiment of scholarship and the final arbiter in identifying mosquitoes. He was accurate and careful in all that he did and wrote; yet he found time to help everyone who was a genuine inquirer. In 1910, a year after his graduation, Edwards was appointed assistant in the entomological section of the department of zoology in the British Museum, and in 1937 he was promoted to be a deputy keeper of the department of entomology which had meanwhile been created. His charge included the crane-flies and the mosquitoes and was later extended to the whole of the nematocerous diptera and he was entrusted with the task of continuing F. V. Theobald's Catalogue of Mosquitoes, which Manson and Ross had shown to be an essential need of tropical medicine. His series of papers in the *Bulletin of Entomological Research* on the culicidæ led up to a general review in the last volume of African mosquitoes, soon to be published by the trustees of the British Museum. He was elected last year to the fellowship of the Royal Society.

LAMENT FOR CHOCOLATE.—Lord Woolton says that chocolate is a luxury, and has cut down the manufacturers' fresh milk, sugar and other raw materials. Meanwhile the demand has become greater than ever, and, rightly, the Services and munition workers have been allotted a generous share. Hinc illæ lacrimæ. No attempt seems to have been made to dilute the supply with inferior substitutes; certainly there is nothing ersatz about the sample which, according to their graceful custom, Messrs. Cadbury Bros. have sent us for Christmas. They claim with justice that chocolate and cocoa are concentrated and convenient foods, and for those who like figures they might add that milk chocolate has a calorie value three times that of boiled eggs, contains as much fat as cheddar cheese or fried gammon and nearly as much protein as egg-white, and is a good source of minerals and vitamin A. Good stuff.

Letters to the Editor

CARBON-MONOXIDE POISONING

SIR,—Those of us who come in contact with the reality of carbon-monoxide poisoning are greatly indebted to Drs. McMichael and Ruskin for their comprehensive study in your issue of Nov. 30. The idea of open-air collapse, due to the absence of carbon dioxide in the fresh air, is particularly interesting. Some five years ago a very skilled chief officer of a large rescue station drew my attention to the frequency of collapse, especially in those cases in which artificial respiration had been performed, with oxygen as an adjunct. I accounted for the condition by a supply of CO_2 in the blood insufficient to stimulate the respiratory centre, bearing in mind that usually the period of rescue was prolonged, that during unconsciousness less CO_2 was made—especially with some of the blood-oxygen replaced by carbon monoxide—and that artificial respiration of pure oxygen washed out vital CO_2 from the air cells of the lungs and reduced its concentration in the blood. My informant has since used a mixture of 10 per cent. CO_2 and oxygen in poisonous atmospheres, and free CO_2 in ordinary air, and I have not recently heard of any collapse or relapse of serious nature. I doubt whether this open-air collapse will be generally accepted as due to the new atmosphere without CO_2. In my own experience amongst firemen, whose work naturally gives them mixed gases, I have not noted it except after exertion.

The typical symptoms, as related by the victim, are a buzzing or throbbing of the head, a giddiness or feeling of uselessness of the limbs, followed by some mental confusion which tends to argumentative excitement. If they rescue themselves and remain in the air, sensible enough to sit down and exaggerate their breathing, the effects soon pass away. Chief officers are warned to watch the period of excitement and to keep the breathing exaggerated in fresh air if necessary by free use of CO_2. By this means the carbon monoxide is readily eliminated, usually before collapse and unconsciousness. Reports from all over the kingdom convince me that the sooner breathing can be exaggerated in the fresh air the more perfect will be recovery.

The so-called delayed symptoms of carbon-monoxide poisoning are not due to the continued presence of the gas in the blood, but to the damage done to cell structure during the stage of anoxia. Artificial respiration is rarely necessary, and if it is performed without added CO_2 unconsciousness is unnecessarily prolonged. In fresh air oxygen is not essential, and the time wasted in procuring it may be the factor to determine life or death. The early—indeed the immediate—use of CO_2 is essential is all cases; almost every fire brigade in the land carries a small supply of it.

GILBERT BURNET,
Chief Surgeon, N.F.B.A.

Hemel Hempstead.

PNEUMOCOCCAL MENINGITIS

SIR,—Dr. Falla (*Lancet*, Nov. 30, p. 698) doubts the accuracy of Squadron Leader Coleman's figure of 35% for the present mortality-rate in pneumococcal meningitis. Dr. Falla suggests that the figure is probably too optimistic and that in fact the mortality is still "extremely high." I find that 16 cases of pneumococcal meningitis have been admitted to the Royal Hampshire County Hospital under my care since August, 1938, and 4 other cases of purulent meningitis, probably pneumococcal, from which the causal organism could not be recovered. In this admittedly small series there have been no deaths. All cases have been treated with sulphapyridine in ordinary doses and by repeated lumbar puncture. In the adult cases 2 g. of sulphapyridine was given, either by mouth or by injection, as the initial dose; this was repeated in four hours and then followed by 1 g. four-hourly. In 2 cases, after apparent control of the infection and a reduction in the drug, clinical relapse appeared which was readily subdued by increasing the dose to 2 g. again. The remaining cases all responded rapidly and went on to complete cure without interruption. The most dramatic case was that of a woman of 24, seven months pregnant, admitted to hospital semi-comatose after two days severe headache; her condition had been diagnosed as toxæmia. Her cerebrospinal fluid appeared as frank pus and was swarming with pneumococci. She was discharged cured in ten days and in due course gave birth to healthy twins. Others could no doubt tell similar stories and I wonder whether the suggested mortality-rate of 35% is not in fact considerably too high. The pneumococcus seems to me more easily destroyed by sulphapyridine in the meninges than in any other situation. Repeated removal of the purulent cerebrospinal fluid has seemed an important part of treatment, analogous to the removal of pus from the pleural cavity in pneumococcal empyema, where drainage is essential for cure even when sulphapyridine treatment has rendered the empyema sterile.

KENNETH ROBERTSON.

Winchester.

COMPULSORY IMMUNISATION

SIR,—Dr. Killick Millard's comments call for amplification of my letter of Nov. 16. Among other things I suggested compulsory active immunisation against diphtheria for all school-children—the term to be used not in a strict legal sense but to include all who are attending nursery and infant schools. There has been and will continue to be a growing exodus of the child population from crowded centres of population to reception areas and the chief danger of the spread of diphtheria will be in the schools. The only practical way of carrying out immunisation in a short time is by close coöperation with the education authorities in the school clinics where it is possible to combine medical supervision with the keeping of records. Immunisation on a voluntary basis would, of course, still be available for the remainder of the child population, but all authorities which have conscientiously undertaken diphtheria immunisation schemes will appreciate how difficult it is to deal quickly with this group. Reduction in the number of cases of diphtheria would help to solve our most immediate problems by allowing us to use the sparse isolation accommodation in reception areas to the best advantage. Judging from my own experience over a number of years, and from the remarkable successes reported by several medical officers of health in their own areas, the failure of voluntary schemes of immunisation, taking the country as a whole, is not due, as many would have us believe, to opposition from the parents, but rather to the failure of many public-health authorities properly to contact the people.

Dr. Millard emphasised his conviction born of long experience that compulsory measures would fail to achieve the desired result and cited as an example the intense opposition which resulted from the attempt in this country, years ago, to make small-pox vaccination really compulsory; but I would point out that the chief arguments elaborated at that time by a small but influential section of the community to bring vaccination into disrepute cannot be advanced with fairness where injections of diphtheria alum toxoid, T.A.B. vaccine and tetanus toxoid are concerned. As several weeks are required to develop the immune state after a course of injections it does not appear to me a wise policy to wait until the epidemic starts before widespread schemes of immunisation are attempted—which appears to be the official view at the moment. It is an unhappy thought that epidemics of infectious disease can decimate the population to an extent which does not appear possible even from the direct effects of the most severe aerial attack. I hope the medical profession generally will voice their disapproval of the present "wait and see" policy.

A. A. CUNNINGHAM.

Edgware, Middlesex.

BLOOD-UREA AND PLASMA CHLORIDE IN EXPERIMENTAL HÆMORRHAGE

SIR,—The rise of blood-urea after hæmorrhage is most likely due to the fall of blood-pressure and very probably has nothing to do with the hæmorrhage as such. We invariably found a rise in blood-urea after lowering the blood-pressure by various methods other than venesection. Blood-pressure aids the renal function—a fact not generally recognised—and a hypotonic condition impairs this function, in consequence of which urea accumulates in the blood. In regard to chlorides, we never succeeded in raising blood chlorides consistently, even after the

administration of large quantities of sodium chloride. If salt is given in larger quantities than the kidney is able to excrete immediately, it goes to the tissues, returning to the blood later on, the blood chlorides remaining unchanged. The osmotic pressure must remain about the same under varying conditions. A substance which may disturb this equilibrium goes either to the tissues or replaces some other blood constituent. For this reason and others consistent results cannot be expected from any attempts to interfere with the blood chlorides.

Liverpool. I. HARRIS.

THE CASSEL HOSPITAL

SIR,—May I bring to your attention the fact that the Cassel Hospital has completed a war-time move to Ash Hall, Bucknall, Stoke-on-Trent. This move has been a difficult task at the present time but it has been carried out with no break in the continuity of treatment, as patients and staff were conveyed to their new home in one day. The situation of the hospital in Kent had for some time been an unfortunate one. After the loss of the Channel ports the invasion threats seemed very much on the doorstep, and the intensive bombing attacks on London and the South-East which developed later in the summer made matters more difficult. Everyone who listens to the B.B.C. bulletins is aware that Kent has received its full share of enemy attention. The effect of all these threats both real and potential upon the patients in the hospital was less than might have been expected. In the last annual report it was noted that the outbreak of war had produced very little overt disturbance upon neurotic and anxiety-ridden patients. This report was written before air-raids had begun in England, but the later impression was substantially the same. Most neurotic patients stood the strain of bombardment well. It must be stressed of course that one is speaking of patients whose illnesses were not caused by such traumata in the first place.

The atmosphere was not however a satisfactory one in which to carry out an intensive psychotherapeutic attack on neurotic symptoms, and the difficulty was increased by the anxiety felt by relatives and friends on behalf of the patients in Kent. Eventually it became evident that the hospital which normally draws patients from all parts of the British Isles was no longer fulfilling its proper function, in view of its geographical position, and the decision to evacuate was therefore reached.

It will fortunately be possible for the hospital to continue its work in a more central position and in a quieter atmosphere. Ash Hall, a converted country mansion about five miles from Stoke-on-Trent, stands nearly 800 feet above sea-level in its own grounds. Minor alterations have made possible the establishment of complete facilities for the treatment of patients, and the methods and scope of treatment will remain the same as at Swaylands.

E. FARQUHAR BUZZARD,
Christ Church, Oxford. Chairman of the Medical Committee.

THINGS TO COME

SIR,—Sir Francis Fremantle has now saved the situation. All that has to be done for the planning of future medicine is to alter the medical curriculum. Ignoring the small results of the last efforts to improve medical training let us be grateful for the knowledge that the study of anatomy and physiology particularly as regards "the processes of fatigue, exhaustion, abuse and decay . . . and defence from accident, &c." will be so important. So that, after the war, when the unemployed figures again soar into millions, when a new Geddes axe will cut down all social services, when further lowering of the standard of living and nutrition will occur, and when perhaps an unlearning people will still suffer further threats of war, we shall then be adequately equipped for all the corresponding medical problems. The scientific knowledge too will be valuable to determine the limits to which the standard of living of the working class can be depressed without spontaneous revolt arising.

But perhaps I am wrong. May it not be that fatigue, exhaustion and abuse are not social necessities? Perhaps a government for the people will order things better by then. A simple programme of minimum wage limits, maximum working hours, adequate housing, recreation and convalescent facilities, abolition of undernutrition, &c., might so alter the health of the nation as to require a new view of medical replanning. Perhaps too the people will demand attention to this problem with such a voice that even the political inertia of the "mass of the profession" will no longer matter.

Portland Place, W.1. HUGH GAINSBOROUGH.

SIR,—Many will be grateful for the lead in Mr. Aleck Bourne's letter in THE LANCET of Nov. 23. Through the persuasion of events numbers of our profession are being convinced that his idea of health is essential for family, social and national survival. He defines it "as a form of beauty and necessary for physical, moral and even spiritual exhilaration." There are medical men who feel that this new quality can be lived out—first in our own lives and in our homes, then in our patients, and so become convincing and available for the world. Our profession must itself be gripped by this conception of full health and how it is attained. Otherwise our aim will remain at the physical and mental level, compared with the physical alone as in the past when we treated mostly the end-results of disease and discord. Mr. Bourne points the need for adding the moral and spiritual to the physical and mental.

The medical world built in the midst of the present mighty upheaval must aim at this full or plenary health. Such health is peace and joy, the result of unselfish creative purpose for body, mind and spirit. This would be infectious health. Demonstration is not wanting that the diseased ego, or spirit, directed by dishonest, impure or selfish motives will produce subtotal health and can even wreck its own body and mind. In addition there is abundant evidence today that the sub-healthy ego will use its instructed mind and its developed body to destroy towns, ships and other persons.

Our profession with its unique advantages can learn the method and technique by which to restore or prevent the diseased ego and so attain this full health. Towards this objective can be the next great advance in medicine.

London. E. T. C. MILLIGAN.

TOO MUCH VENTILATION

SIR,—The views expressed by Dr. Copeland go back to Victorian days when tuberculosis was treated in shut-up warm rooms, sand-bags closed door and window crannies, and children of the well-to-do wore respirators out of doors in winter. The fear of night air arose from the ignorance of the cause of malaria as a mosquito-borne infection. Children catch cold on going back to school after the holidays because carriers bring infection into a non-immune herd crowded in shut-up rooms. It has nothing to do with damp beds, for we know that schools with children sleeping in the open air do not suffer from such infections at all. People isolated in damp cold climates such as Spitzbergen escape them until a ship brings in infection. Soldiers exposed in trenches in winter, and sailors on trawlers in the North Sea, escape them until they return on leave to hot crowded rooms. Patients having open-air treatment escape, while the nurses who shut themselves up in warm rooms suffer from such infections. In cold misty air there is very little water, and such air when warmed up in the respiratory tubes is far drier than the air of warm crowded rooms. The breathing of cold air stimulates the flow of blood through, and the secretion of mucus from the respiratory membrane; these are the natural defences against infection.

St. John Clinic, S.W.1. LEONARD HILL.

NICOTINIC ACID FOR BLISTERS ON THE LIP

SIR,—Nicotinic acid has been used in the treatment of various conditions of the skin and oral mucous membrane with such success that I was induced to try its effect in the following case.

A woman of 38 had her third pregnancy at the end of March 1940. Soon after she noticed a blister on her lower lip; this persisted for about a week and then burst, discharging a straw-coloured fluid. For the next four months she had a succession of these bullæ, generally three or four being present together.

They were accompanied by severe itching and tenderness. She also complained of a swelling under the lip. The patient was sent to the Dundee Dental Hospital on Aug. 17 because it had been suggested that her blisters might have something to do with the teeth or gums. She seemed to be suffering much pain and confessed that she thought she had cancer. Five small blisters were seen in different stages of formation and resolution on her lip, but the swelling she complained of was not found. The gums were normal.

The history and appearance led me to think that the condition might be due to some vitamin deficiency, and I decided to try the effect of nicotinic acid.

On Aug. 20, the patient was given 250 mg. of nicotinic acid (150 mg. in the morning and 100 mg. in the evening) and these doses were repeated the following day. By the 22nd the lip was almost normal in appearance, there was no pain, and the sensations of itchiness and swelling had gone. She had been warned about the flush and itching which usually follows large doses of nicotinic acid. These lasted for about half-an-hour the first day and about a quarter-of-an-hour on the second, and a slight redness persisted for about a week on the left side of the nose. Daily doses of nicotinic acid were given—150 mg. for four days and 100 mg. for the subsequent four days. During the next three months the patient was observed at intervals; there has been no recurrence of the blistering and the lip has remained normal.

I went carefully into the patient's dietary, and found that it was the same as that of the rest of the household, and such as might be expected in a well-to-do and comfortable working-class family.

Dundee Dental Hospital. H. GORDON CAMPBELL.

Medical News

University of Oxford

At its meeting on Nov. 27 the board of the faculty of medicine decided that there should be an extra first B.M. examination beginning on Monday, March 17, 1941.

Royal College of Surgeons of England

At a meeting of the council of the college held on Dec. 12, with Mr. Hugh Lett, the president, in the chair, Mr. Robert Milne, Mr. V. Zachary Cope, Mr. C. E. Shattock, Lieut.-Colonel M. F. Nicholls, and Mr. E. W. Riches were admitted members of the court of examiners.

A resolution of thanks was passed for the gift of $7,500 from the Rockefeller Foundation for evacuating the library and research laboratories. A legacy of £1,800 from the late Sir Charles Tomes was reported.

A diploma of membership was granted to J. H. Hicks (Birmingham), and diplomas of fellowship to the following:—

S. F. Taylor, Oxfd and King's Coll.; J. G. C. Spencer, M.D. Camb., Lond. Hosp.; G. De Lacey, L.R.C.P., Lond. Hosp.; H. C. Fletcher-Jones, M.B. Lond., Westminster and Guy's; H. D. Johnson, M.B. Camb., St. Thomas's; C. Langmaid, M.B. Lond., Cardiff; J. A. Seymour-Jones, M.B. Camb., St. Thomas's; F. S. A. Doran, M.B. Camb., Manc. and Guy's; Eleanor M. Mills, M.B. Manc.; D. P. van Meurs, M.B. Lond., St. Thomas's and Lond. Hosps.; B. R. Billimoria, L.R.C.P., St. Bart.'s; G. Flavell, L.R.C.P., Otago and St. Bart.'s; H. C. Barry, L.R.C.P., Oxfd and Lond. Hosp.; W. G. Mills, M.B. Birm.; I. M. Jackson, M.B. Camb., Lond. Hosp.; A. F. Williams, M.B. Manc.; R. D. Bisset, M.B. N.Z., Otago and Guy's; Edith A. M. Whetnall, M.B. Lond., King's College; J. F. Bourdillon, B.M. Oxfd, St. Thos.; D. A. Arnott, M.B. N.Z., Otago; Abd el Salam El Barbary, M.B. Cairo, Lond. and Guy's Hosps.; F. W. Connaughton, M.B. Melb., St. Bart.'s; W. W. Gilford, B.M. Oxfd, Guy's; G. J. Hanly, M.B. N.U.I., Dubl.; C. B. Innes, M.B. N.Z., Otago; Roshdi Ismail, M.B. Cairo, St. Bart.'s; Harbans Lal, M.B. Punjab; C. T. Möller, M.B. W'trand, Guy's; L. I. Parton, M.B. N.Z., Otago; W. L. Phillips, M.B. W'trand; Rameshwar Prasad, M.B. Bombay, Guy's; and L. L. Samy, M.B. Cairo, Guy's.

The following diplomas were granted, jointly with the Royal College of Physicians:—

Diploma in anæsthetics—D. Aserman, W. Auld, A. J. W. Beard, H. M. Bird, Agnes C. Clark, R. M. Davies, F. C. Deller, O. P. Dinnick, Nancie I. Faux, W. J. Finnie, H. F. Harvey, D. Hewspear, T. H. Hughes, J. U. Human, H. Kopelman, J. L. Linacre, B. E. P. McCullough, H. C. Maclaren, T. T. P. Murphy, N. C. Porter, J. F. Rickards, J. D. Rochford, H. J. Shorvon, Margaret N. Smith, J. H. Taylor, A. Tindal, W. J. Walter and H. B. Wilson.

Diploma in laryngology and otology—L. S. Corner, J. B. Dowe, G. S. Irvine and K. H. Singh.

University of London

At recent examinations the following were successful:—

D.P.M.

With special knowledge of mental diseases (psychiatry).—W. E. W. Bridger, Matthew Radzan.

With special knowledge of mental deficiency.—Jaime de Bastarrechea.

University of Edinburgh

On Dec. 13 the following degrees and diploma were conferred:—

M.D.—*J. D. Allan, **G. J. Carr (in absentiâ), T. A. MacGibbon (in absentiâ), K. D. Salzmann (in absentiâ) and G. M. Thomson.

M.B., Ch.B.—W. G. Batters, A. L. Bell, Margaret H. Calder, Angus Campbell, W. C. Clark, J. M. Dawson, R. C. Dickson, Joseph Falk, Elizabeth Hainsworth, Abdel-Hamid Haseeb, J. L. Huggan, E. L. Knox, W. M. Latham, E. M. Leyland, G. B. Libbey, M. R. Liddell, P. J. Loots, Lucy M'Farlan, I. G. M'Gregor, J. F. M'Harg, Morrison M'Murrich, Alison M. Macquarrie, J. S. Main, James May, J. T. Millar, F. E. Milson, G. H. Murray, S. M. Musgrave, L. D. Philp, D. H. Pirie, W. V. Pole, Isobel J. Robertson, P. H. Scott, J. P. Sexton, R. L. Walsh, I. M. Wood and Arnold Young.

D.M.R.—Hassan Din, and Herman Hirschson.

* Commended for thesis. ** Highly commended for thesis.

University of Dublin

On Dec. 11 at the school of physic, Trinity College, the following degrees were conferred:—

M.A.O.—J. B. Fleming.

M.D.—P. A. McNally.

M.B., B.Ch., B.A.O.—Wilbur Badner, Olga Bloom, N. C. Brown, R. M. Haiahan, J. T. Hanna, H. T. Hutchinson, E. G. W. Lynch, Yvonne O. Mallet, Harry Menter, Edna G. Merrick, J. G. P. Mullally, J. M. Slattery, N. M. Smith, B. E. R. Solomons, J. I. Stafford, Gilbert Tattersall and I. T. Wolpe.

National University of Ireland

At recent examinations at University College, Cork, the following were successful:—

FINAL EXAMINATION FOR M.B., B.CH., B.A.O.

R. F. O'Driscoll, R. B. O'Neill, William Cahill (with first-class honours); M. D. J. T. O'Riordan, Maire Henley, L. N. O'M. O'Ceallaigh (with second-class honours); Margaret M. Coakley, J. C. Delap, W. F. O'M. Doherty, D. A. Heffernan, John Hutch, T. F. Leonard, M. J. McSwiney, Edward Murphy, Dermott O'Driscoll, John Sheehan, R. J. Sheehan, H. B. Willington, J. A. Desmond and M. C. Duggan.

D.P.H.

Thomas Creedon, Mary Corbett, D. F. Murphy, and C. P. O'Connell.

D.P.M.

T. G. A. Carroll.

Army Casualties

The following casualties in the R.A.M.C. are announced:—

Prisoner of War.—Lieutenant G. M. Anderson, M.B.; A/Major J. D. Finlayson, M.B. Glasg.; Captain J. P. Fox, M.B.; and T/Major A. H. Weston, M.B. Edin.

Previously reported missing, believed prisoner of war, now reported prisoner of war.—Lieutenant J. W. S. Irwin, M.B. Belf.

The seventh list of subscriptions to the Medical War Relief Fund brings the total amount contributed to over £12,600.

Births, Marriages and Deaths

BIRTHS

BLACKDEN.—On Dec. 10, at Quetta, the wife of Major J. F. Blackden, I.R.A.M.C.—a daughter.

DARBISHIRE.—On Dec. 9, at Greenodd, near Ulverston, the wife of Dr. S. B. Darbishire—a son.

FABER.—On Dec. 9, at Aldershot, the wife of Lieutenant Graham Faber, R.A.M.C.—a daughter.

HARRISON.—On Dec. 10, at Downham Market, Norfolk, the wife of Dr. L. T. Harrison—a son.

HURFORD.—On Oct. 30, at Watford, the wife of Dr. J. V. Hurford—a daughter.

REDMOND.—On Dec. 9, the wife of Dr. Aidan Redmond—a daughter.

MARRIAGES

FRANKENBERG—SMITH.—On Dec. 10, in London, John Frankenberg, M.R.C.S., Flying Officer, R.A.F.V.R., to Nancy Smith, S.R.N.

DEATHS

BIRD.—On Dec. 15, at Bridgwater, George William Harvey Bird, M.B. Camb., aged 70.

BRENCHLEY.—On Dec. 6, at Bournemouth, Algernon Dutton Brenchley, M.D. Aberd., past-master of the Society of Apothecaries of London, aged 86.

BUNBURY.—On Dec. 12, Edwin Garrett Bunbury, M.R.C.S., of West Hill, Ottery St. Mary.

PELLY.—On Dec. 9, at Buckland Monachorum, Huntly Nevins Pelly, L.R.C.P.E., D.T.M., aged 75.

SCOTT.—On Dec. 13, at Liss, William Lochhead Scott, M.D. Lond.

SIMMONDS.—On Dec. 12, at Sidcup, William Allason Simmonds, M.R.C.S., Lieut.-Colonel I.M.S. retd., aged 90.

WILSON.—On Dec. 13, at Cookham, Hugh Cameron Wilson, M.D. Edin., F.R.C.S.

WOODS.—In December, 1940, in Australia, Charles William Tuthill Woods, M.D. Brux., M.R.C.S.

Notes, Comments and Abstracts

THE EVILL DOCTOR

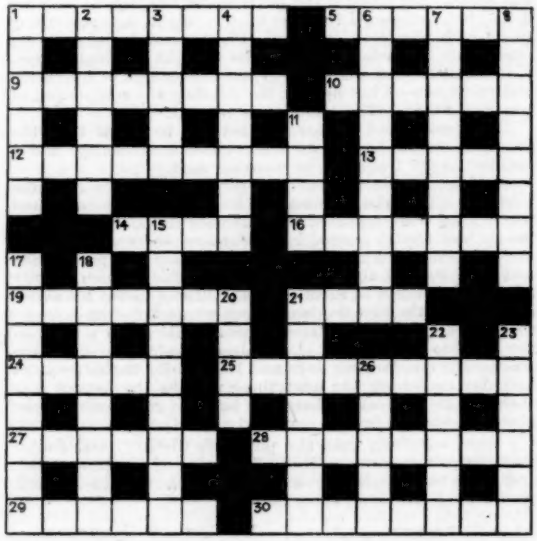
SCROFULA has been a good source of income to many a quack in its day, but it is possible that one or two of these unorthodox practitioners believed they had hit on a remedy. Mr. S. Wood, in the *Annals of Medical History* for September, gives an account of Mr. William Vickers, a clergyman, who may or may not have thought he was on to something good. At all events he was himself a victim of the king's evil, and he found a remedy which he afterwards claimed had cured him. As soon as this "anti-strumatick liquor" was incorporated in the blood "the scrofulous ulcers opened like so many floodgates, pouring out the humour with a mighty current." Mr. Vickers lived at the time of laudable pus, when nature was expected to accomplish the "decoction and despumation of morbifick matter." He began to treat the king's evil in 1706. Feeling that the great gift he had discovered must be applied to the common good he published a pamphlet on his specific. He seems to have given general satisfaction, for in 1709 his pamphlet went into a second edition, and this time he was able to announce 79 "extraordinary cures." After that it seems to have been plain sailing. Various clerical colleagues sent him patients and he cured the nephew of the surgeon-general in five months. He moved in the highest circles and was exceedingly huffy if remedies other than his were preferred by his friends. His specific was sent to patients living at a distance on the strength of a description of their symptoms. All this suggests that he was an honest man with a bee in his bonnet, but one or two facts about him put him in a less innocuous light. For one thing he was concerned to make as much money as possible out of his cure. "Claydon is one of the best stages I keep," he wrote to his kinsman by marriage, Lord Fermanagh, "twenty or thirty Guineys is the least I gett in an afternoon, my Packetts are so well approved. . . . Pray be sicke when I come into those parts that I may once more gett some of your Rino." He even went on a tour of the country to practise his art and enrich himself. But his relations, as so commonly happens, were not impressed. They called him the Evill Clergyman and the Prince of Darkness, and one of them, Sir Thomas Cave, was frankly sceptical. "I had this day with me one of Vickers's patients of a year's standing," he wrote to Lord Fermanagh, "whom he says he has done good to in her body but can't cure her face. Yet he sends her to be toucht, and I feare in a little time his honesty will be so well known that all his customers will come to the Queen." Well, Queen Anne at all events believed in her capacity to cure the evil, and was the last English monarch to enjoy that confidence. Mr. Vickers kept the secret of his remedy, and the only ingredient he mentions is spring water.

TRIPLE DYE LOTION FOR BURNS

Messrs. CROOKES LABORATORIES point out that in addition to their Tannic Acid Jelly (which itself contains the triple dye mixture incorporated with the tannic acid) they have had available for some time a triple dye lotion, under the name of Crystoflavine Burn Lotion, designed for the treatment of burns in cases where circumstances or personal preference make it undesirable to use tannic acid. This triple dye mixture, originated by Aldrich in 1933 (*New Engl. J. Med.* **208**, 299), consisting of brilliant green, gentian violet and acriflavine, was used with satisfactory experimental results confirmed by clinical experience. Thus Devine (*Med. J. Aust.* 1939, **1**, 14 and 924) treated 27 cases with this mixture and confirmed its superiority in resisting infection of the burnt area and also found the mixture to possess a distinct analgesic action.

Crystoflavine burn lotion is submitted as an alternative to tannic-acid treatment in burns of the second or third degree on the fingers where a rigid eschar may lead to constriction of the digital circulation. The lotion is dabbed or painted on the burn and allowed to dry. A second treatment is given after half an hour. Blisters should be snipped and dead skin removed. No dressing is applied.

LANCET CROSSWORD



ACROSS

1. You'll find the same in an heroic story making a mass attack (8).
5. (With 20 down) Syndactylism—but which digits? (Two words. 6, 4).
9. Most of the senators with scabies is certainly weird (8).
10. Royal Highlanders with poems are these far-fetched scholars (6).
12. Even a band can block the small one (9).
13. These stools upset the nursery (5).
14. A container for 28 in the plural (4).
16. This thins things out (7).
19. No butcher, but his joints are famous (7).
21. Where the verbalist scores. (4).
24. With a smaller saint this would be a defect of speech (5).
25. Ten aisles are needed here. (9).
27. "Their object is . . . to prevent the shattering effect of noise on the ——" (Official Description of Ear Plugs) (6).
28. Protective covering (8).
29. Though the Orient divides them, making them as empty froth, they still remain—wise? (6).
30. The man who is here can never be stumped—a gain on the whole (8).

DOWN

1. Ice is broken round the underground—a sickening affair (6).
2. To write—but it takes a good bit of editing (6).
3. It divides the Emergency Medical Service giving vent to—heat or light? (5).
4. There is much in this bone (7).
6. Automatic mimicry of words (9).
7. A deb. with roses is not quite the same as this affliction to the sufferer (Two words, 3, 5).
8. The factions follow Pluto (8).
11. A late and great neurologist (4).
15. Concerning a churlish fellow with a gape—all returning at intervals (9).
17. The Scot's accent leads the old French marechal to make a point for surgeons (8).
18. I eat crab—but my anagram will digest anything. (8).
20. See 5 across.
21. Not a woman in a ferment but a ferment in a woman (7).
22. Not the cause of card-room asthma (6).
23. Dad gets mixed with the sticky stuff and becomes a perfect pest (6).
26. Strong head wind (5).

The solution will appear in our next issue.

Appointments

BEBBINGTON, EVELYN, F., M.B. Lpool, D.P.H.: temp. asst. M.O. (maternity and child welfare) for Coventry.

HANSEN, E. T., M.R.C.S.; R.S.O. at Hansfield and District General Hospital.

LATTO, CONRAD, M.B. St. And., F.R.C.S.E.: R.S.O. at the Prince of Wales Hospital, Plymouth.

LUNN, J. G. T., M.B. Aberd.: R.M.O. at Salisbury General Infirmary.

MILLINGTON, ESMOND, M.R.C.S., D.M.R.E.: hon. radiologist to the Royal Alexandra Hospital for Sick Children, Brighton.

ROWLAND, Millicent, M.B. Lond.: temp. asst. school M.O. for Derbyshire.

SMITH, HAROLD, M.D., Western Univ., Ontario, F.R.C.S.E.: R.S.O. at Preston Royal Infirmary.

TYRER, F. H., M.A. Camb., M.R.C.S.: temp. asst. school M.O. for Stoke-on-Trent.

WADDLE, NORMAN, M.B. N.Z., F.R.C.S.E.: R.S.O. to the Royal Infirmary unit of the Royal Sheffield Infirmary and Hospital.